OMB No. 2040-0042 Approval Expires 12/31/2018

United States Environmental Protection Agency
Washington, DC 20460

Completion Form For Injection Wells

Administrative Information

1. Permittee: Florence Copper Inc.

Address *(Permanent Mailing Address) (Street, City, and ZIP Code)*: 1575 W Hunt Hwy, Florence, AZ 85132

2. Operator: Florence Copper Inc.

Address *(Street, City, State and ZIP Code)*: 1575 W Hunt Hwy, Florence, AZ 85132

3. Facility Name: Florence Copper Inc.

Telephone Number: (520) 374-3984

Address *(Street, City, State and ZIP Code)*: 1575 W Hunt Hwy, Florence, AZ 85132

4. Surface Location Description of Injection Well(s)

State: Arizona

County: Pinal

Surface Location Description

SW 1/4 of SW 1/4 of NE 1/4 of SW 1/4 of Section 28 Township 4S Range 9E

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 1010 ft. frm (N/S) N Line of quarter section and 1040 ft. from (E/W) E Line of quarter section.

Well Activity

- [ ] Class I
- [ ] Class II
  - [ ] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [x] Class III
- [ ] Other

Well Status

- [x] Operating
- [ ] Modification/Conversion
- [ ] Proposed

Type of Permit

- [ ] Individual
- [x] Area : Number of Wells 33

Lease Number: NA

Well Number: I-01

Submit with this Completion Form the attachments listed in Attachments for Completion Form.

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Ian Ream, Senior Hydrogeologist		9-12-2018

Attachments to be submitted with the Completion report:

I. Geologic Information

1. Lithology and Stratigraphy

A. Provide a geologic description of the rock units penetrated by name, age, depth, thickness, and lithology of each rock unit penetrated.

B. Provide a description of the injection unit.

(1) Name
(2) Depth (drilled)
(3) Thickness
(4) Formation fluid pressure
(5) Age of unit
(6) Porosity (avg.)
(7) Permeability
(8) Bottom hole temperature
(9) Lithology
(10) Bottom hold pressure
(11) Fracture pressure

C. Provide chemical characteristics of formation fluid (attach chemical analysis).

D. Provide a description of freshwater aquifers.

(1) Depth to base of fresh water (less than 10,000 mg/l TDS).
(2) Provide a geologic description of aquifer units with name, age, depth, thickness, lithology, and average total dissolved solids.

II. Well Design and Construction

1. Provide data on surface, intermediate, and long string casing and tubing. Data must include material, size, weight, grade, and depth set.

2. Provide data on the well cement, such as type/class, additives, amount, and method of emplacement.

3. Provide packer data on the packer (if used) such as type, name and model, setting depth, and type of annular fluid used.

4. Provide data on centralizers to include number, type and depth.

5. Provide data on bottom hole completions.

6. Provide data on well stimulation used.

III. Description of Surface Equipment

1. Provide data and a sketch of holding tanks, flow lines, filters, and injection pump.

IV. Monitoring Systems

1. Provide data on recording and nonrecording injection pressure gauges, casing-tubing annulus pressure gauges, injection rate meters, temperature meters, and other meters or gauges.

2. Provide data on constructed monitor wells such as location, depth, casing diameter, method of cementing, etc.

V. Logging and Testing Results

Provide a descriptive report interpreting the results of geophysical logs and other tests. Include a description and data on deviation checks run during drilling.

VI. Provide an as-built diagrammatic sketch of the injection well(s) showing casing, cement, tubing, packer, etc., with proper setting depths. The sketch should include well head and gauges.

VII. Provide data demonstrating mechanical integrity pursuant to 40 CFR 146.08.

VIII. Report on the compatibility of injected wastes with fluids and minerals in both the injection zone and the confining zone.

IX. Report the status of corrective action on defective wells in the area of review.

X. Include the anticipated maximum pressure and flow rate at which injection will operate.

HALEY & ALDRICH, INC.
One Arizona Center
400 E. Van Buren St., Suite 545
Phoenix, AZ 85004
602.760.2450

TECHNICAL MEMORANDUM

14 September 2018
File No. 129687-010

TO: Florence Copper Inc.
Ian Ream, Senior Hydrogeologist

FROM: Haley & Aldrich, Inc.
Lauren Candreva, R.G.

Subject: Drilling, Installation, and Integrity Testing Summary
PTF Recovery Well I-01
Florence Copper Inc., Florence, Arizona

This document summarizes the drilling, installation, and testing of Production Test Facility (PTF) recovery well I-01 for Florence Copper Inc. (Florence Copper) in Florence, Arizona, including the equipment used to perform the work, completion, and the results of well testing activities. Separate well completion reports have been created for each PTF well.

The Arizona Department of Water Resources Registry ID for well I-01 is 55-227963; the Well Registry Report is included in Appendix A. Well I-01 is located in the southwest quarter of the northeast quarter of the southwest quarter of Section 28 of Township 4 north, Range 9 East of the Gila and Salt River Baseline and Meridian (D(4-9)28CAC). Well I-01 is located within the Underground Injection Control (UIC) Permitted Area of Review (AOR) for UIC Permit R9UIC-AZ3-FY11-1 and was completed as a Class III injection well for the PTF; the well location is shown on Figure 1.

Florence Copper contracted Hydro Resources, Inc. (Hydro Resources) to drill, install, and test well I-01 in accordance with *Well Specification: Drilling, Installation, and Testing of Class III Injection and Recovery Wells, Production Test Facility, Florence, Arizona* (Haley & Aldrich, Inc. [Haley & Aldrich], 2017). A Midway 3500 drilling rig was used for all drilling and construction activities. Haley & Aldrich provided oversight of drilling activities, geophysical logging, well installation, and testing. All reported depths are in feet below ground surface unless otherwise noted.

I. Geologic Information

1. Lithology and Stratigraphy

   A. Geology of Penetrated Units

   The geology penetrated during drilling of the Class III well I-01 is summarized below and a lithologic log is included in Appendix B.

Lithologic Unit Name	Depth to Bottom of Unit (feet)	Thickness of Unit (feet)	Lithology and Age of Unit
Upper Basin Fill Unit (UBFU)	283	283	Alluvium; Quaternary to Tertiary
Middle Fine-Grained Unit (MFGU)	300	17	Alluvium; Tertiary
Lower Basin Fill Unit (LBFU)	378	78	Alluvium; Tertiary to Cretaceous
Bedrock Oxide Unit (Oxide)	Not encountered	>842	Igneous porphyry; Precambrian

   B. Description of Injection Unit

Parameter	Bedrock Oxide Unit
Depth Drilled	1,220 feet
Thickness	>842 feet
Formation Fluid Pressure	Atmospheric plus head of freshwater; no additional formation pressure
Age of Unit	Precambrian with intrusions of Precambrian to Tertiary rocks
Porosity[1]	Average = 7.9%
Permeability	Hydraulic conductivity = 0.56 feet per day
Bottom Hole Temperature	29 degrees Celsius
Lithology	Igneous porphyry: quartz monzonite, granodiorite with diabase and andesite dykes (detailed log included in Appendix B)
Bottom Hole Pressure	Approximately 430 pounds per square inch (PSI) (pressure exerted by the column of freshwater with no additional contribution from formation pressure)
Fracture Pressure	0.65 PSI per foot
[1] Porosity values calculated from neutron borehole survey conducted at Injection Well I-01.	

C. Chemical Characteristics of Formation Fluid

The chemical characteristics of the formation fluid in the injection zone are summarized below and are the sampling results from the center PTF wellfield well, R-09. The table below summarizes the primary chemical characteristics detected in a formation fluid sample collected on 23 April 2018; the complete analytical report is included in Appendix C.

Analyte	Result (mg/L)
Metals	
Aluminum	<0.08
Antimony	<0.005
Arsenic	0.0016
Barium	0.071
Beryllium	<0.0005
Cadmium	<0.00025
Calcium	140
Chromium	0.0051
Cobalt	<0.00025
Copper	0.011
Iron	<0.30
Lead	<0.0005
Magnesium	27
Manganese	0.002
Mercury	<0.001
Nickel	0.0033
Potassium	6.8
Selenium	<0.0025
Sodium	170
Thallium	<0.0005
Zinc	<0.04
Anions	
Bicarbonate	150
Chloride	310
Fluoride	<0.5
Nitrate	8.8
Sulfate	190
Field Parameters	
Total Dissolved Solids	1,000
pH	7.8
Radiochemicals	
Uranium	0.016
Notes: *mg/L = milligrams per liter*	

Results of the sampling of well I-01 are included in the *PTF Mine Block Ambient Groundwater Concentrations and Initial Discharge Characterization of the Underground Workings* (Brown and Caldwell, 2018).

D. Description of Freshwater Aquifers

1) The depth to the base of the freshwater aquifer is defined by the interface at which deeper formation fluid exhibits a total dissolved solids (TDS) value of 10,000 milligrams per liter (mg/L). The depth of the 10,000 mg/L interface is deeper than all the wells drilled at the site and consequently has not been defined.

2) A geologic description of the aquifer units is included below:

Aquifer Unit Name	Age	Depth (feet)	Thickness (feet)	Lithology	Average Total Dissolved Solids[1] (mg/L)
UBFU	Quaternary/Tertiary	0 to 283	283	Alluvium	914
LBFU	Tertiary	300 to 378	78	Alluvium	754

[1] Average TDS values calculated from UBFU and LBFU monitoring well ambient monitoring results near the PTF.

II. Well Design and Construction

1. Well I-01 Casing Installed

Casing	Material	Diameter (inches)	Weight (pounds per foot)	Depths (feet)	Borehole Diameter (inches)	Drilling Method
Surface	Mild steel	24 O.D. 23¼ I.D.	94.71	0 to 40	30	Solid-stem auger
Overburden (intermediate)	Mild steel – bottom 40 feet poly coated	14 O.D. 13⅜ I.D.	47.36	0 to 500	20	Reverse flooded rotary
Well casing	FRP	5.47 O.D. 4.74 I.D.	5.40	-1.9 to 521	Inside overburden casing to 500 feet; 12¼	Inside overburden casing/reverse flooded rotary
Screen	PVC Sch. 80 with 0.080-inch-wide slots	5.56 O.D. 4.81 I.D.	4.08	521 to 642 661 to 881 901 to 1,201	12¼	Reverse flooded rotary
Blank intervals	Stainless steel Sch. 40 – Type 316L	5.56 O.D. 5.047 I.D.	14.75	642 to 661 881 to 901	12¼	Reverse flooded rotary

Notes:
FRP = fiberglass-reinforced plastic
I.D. = inside diameter
O.D. = outside diameter
PVC = polyvinyl chloride
Sch. = Schedule

2. Well Cement

Cement Interval	Cement Type	Additives	Amount Installed (cubic yards)	Method of Emplacement
Surface casing	Type V Neat 21 sack slurry	None	3.5	Submerged tremie
Overburden casing	Type V Neat 21 sack slurry	None	31.6	Displacement – installed through drillable grout shoe with one-way stab-in valve and welded to the bottom of the casing
Well casing	Type V Neat 21 sack slurry	None	17.4	Submerged tremie

Field forms documenting pipe tallies, annular materials and cement tickets are included in Appendix D.

3. Annular Packers

No annular packers were used during construction of well I-01.

4. Centralizers

Casing	Centralizer Type	Number and Spacing
Overburden	Mild steel – welded	12 installed – every 40 feet
Well – FRP and PVC	Stainless steel – heavy duty	28 installed – every 40 feet
Notes: *FRP = fiberglass-reinforced plastic* *PVC = polyvinyl chloride*		

5. Bottom Hole Completion

There is no bottom hole completion, as this is not an oil/gas well. The well was completed at the bottom with a stainless-steel endcap of the same diameter as the well screen.

6. Well Stimulation

No well stimulation was used during the drilling and construction of well I-01.

III. Description of Surface Equipment

1. Surface Equipment

Well I-01 is an injection well and has been equipped with an inflatable packer. The 2-inch diameter injector pipe extends from the well head and into the manifold that conveys the injection fluid from the plant on-site. A diagram of the wellhead is included as Figure 2.

IV. Monitoring Systems

1. Well Monitoring Equipment

Equipment Type	Location	Type	Purpose
Pressure transducer	Well Casing – 400 feet bgs	Recording	Monitor water column/pressure
Pressure transducer	Well Casing – on packer at 645 feet bgs	Recording	Monitor water column/pressure
Flow meter	Wellhead	Recording	Monitor injection rate
Pressure transducer	Wellhead	Recording	Monitor wellhead pressure
Notes: *bgs = below ground surface*			

2. Monitoring Wells

A total of 16 monitoring wells are associated with the PTF: 7 point-of-compliance (POC) wells, 7 United States Environmental Protection Agency (USEPA) supplemental monitoring wells, and 2 operational monitoring wells. The POC wells are located outside the AOR and are not constructed as Class III wells. The supplemental monitoring and operational monitoring wells are located within the AOR and are constructed as Class III wells as required by the UIC Permit. The wells are summarized in the tables below by type.

POC Wells						
Well ID	**Location X/Y (State Plane NAD 83)**	**Depth (feet)**	**Well Nom. Diameter (inches)**	**Cementing Method**	**Screened Interval (feet)**	**Screened Lithologic Unit**
M14-GL	846750.23 746461.52	859	5 9/16 OD	Submerged tremie	778 to 838	LBFU
M15-GU	846697.17 746464.82	615	5 9/16 OD	Submerged tremie	554 to 594	LBFU
M22-O	846751.26 746514.47	1,140	5 9/16 OD to 528 feet; 4½ OD to 1,140 feet	Submerged tremie	932 to 1,130	Oxide

POC Wells						
Well ID	**Location X/Y (State Plane NAD 83)**	**Depth (feet)**	**Well Nom. Diameter (inches)**	**Cementing Method**	**Screened Interval (feet)**	**Screened Lithologic Unit**
M23-UBF	846688.13 746512.48	250	6 5/8 OD	Submerged tremie	210 to 250	UBFU
M52-UBF	851092.00 774178.00	274	5 9/16	Submerged tremie	198 to 273	UBFU
M54-LBF	847331.96 746682.61	630	5 9/16	Submerged tremie	310 to 629	LBFU
M54-O	847342.99 746702.36	1,199	5 9/16	Submerged tremie	668 to 1,198	Oxide
OD = outside diameter						

Supplemental Monitoring Wells						
Well ID	**Location X/Y (State Plane NAD 83)**	**Depth (feet)**	**Well Nom. Diameter (inches)**	**Cementing Method**	**Screened Interval (feet)**	**Screened Lithologic Unit**
M55-UBF	847541.46 746280.63	261	5	Submerged tremie	240 to 260	UBFU
M56-LBF	847518.70 746303.41	340	5	Submerged tremie	320 to 340	LBFU
M57-O	847378.37 746248.93	1,200	5	Submerged tremie	523 to 1,199	Oxide
M58-O	847672.23 746595.97	1,200	5	Submerged tremie	594 to 1,199	Oxide
M59-O	847934.95 746218.89	1,201	5	Submerged tremie	534 to 1,199	Oxide
M60-O	847599.37 745903.70	1,201	5	Submerged tremie	444 to 1,200	Oxide
M61-LBF	848184.46 746148.88	629	5	Submerged tremie	429 to 629	LBFU

Operational Monitoring Wells						
Well ID	**Location X/Y (State Plane NAD 83)**	**Depth (feet)**	**Well Nom. Diameter (inches)**	**Cementing Method**	**Screened Interval**	**Screened Lithologic Unit**
MW-01-LBF	847487.97 746360.54	444	5	Submerged tremie	330 to 440	LBFU
MW-01-O	847499.04 746369.31	1,200	5	Submerged tremie	500 to 1,200	Oxide

V. Logging and Testing Results

Borehole geophysical logging was conducted on well I-01 in four phases: 1) open-hole surveys in the 20-inch borehole prior to installation of the overburden casing; 2) cased-hole surveys in the 14-inch casing; 3) open-hole surveys in the 12.25-inch borehole prior to installation of the well casing and screen; and, 4) cased-hole surveys in the completed well.

The open-hole geophysical surveys completed at well I-01 included:

- Spontaneous potential;
- Natural gamma;
- Electrical resistivity (short and long normal);
- Neutron;
- Caliper with calculated volume;
- Temperature;
- Sonic; and
- Deviation.

The cased-hole geophysical surveys completed included:

- Cement bond log (overburden steel casing);
- Sonic (for cement bond with fiberglass reinforced plastic [FRP]);
- 4 pi density (for cement bond with FRP);
- Dual density (for cement bond with FRP);
- Natural gamma;
- Fluid conductivity;
- Temperature; and
- Gyroscopic deviation.

Open-hole geophysical surveys were used to support identification of the lithologic contacts, to evaluate the condition of the borehole, and to evaluate the deviation of the borehole.

The primary logs used to evaluate lithologic contacts were natural gamma ray, short (16-inch) and long (64-inch) normal electrical resistance, and single-point resistance. In addition, a neutron survey was conducted at well I-01. The neutron survey was primarily used to evaluate the porosity of the formation; it was only conducted on select wells.

The lithologic contacts for the Middle Fine-Grained Unit (MFGU) were selected based on the short and long resistance and the single-point resistance. All the resistivity values decreased and remained

consistently low through the MFGU. This contact is generally characterized by a relatively sharp decrease in resistance at the top of the unit and a gradual increase in resistance below the bottom of the unit.

The contact between the Lower Basin Fill Unit (LBFU) and the bedrock was identified primarily using the natural gamma and correlated with the resistance logs. There is a consistent increase in gamma values at the contact between the LBFU and the bedrock that was identified and documented at the site during exploration in the 1990s. For well I-01, the gamma values are consistent at approximately 60 American Petroleum Institute (API) units throughout the Upper Basin Fill Unit (UBFU) and MFGU, increase slightly to approximately 70 API units in the LBFU, and then increase at 378 feet to over 110 API units. After the increase at 378 feet, the natural gamma begins to vary more than in the alluvial units. This change in the response of the natural gamma indicates the contact with the bedrock unit. Also, at this approximate depth, the resistance increases, likely because the bedrock contains less water, leading to increased resistivity.

Cased-hole geophysical surveys were conducted to evaluate the cement seal and the casing-cement bond, to document baseline fluid temperature and conductivity, and to evaluate the plumbness of the well. The cement bond is discussed in Section VII.

Copies of all the open-hole geophysical logs and cased-hole temperature, fluid conductivity, and natural gamma logs are included in Appendix E; a figure summarizing the open-hole logs used to evaluate the geology is included as Figure 3. The cased-hole logs used to evaluate the cement bond are included in Appendix E**.**

VI. Well As-Built Diagram

An as-built diagram for well I-01 is included as Figure 4. A diagram showing the wellhead completion is included as Figure 2.

VII. Demonstration of Mechanical Integrity

A demonstration of Part I mechanical integrity of the well was completed using a standard annular pressure test (SAPT) in accordance with Part II.E.3.a.i.A of the UIC Permit. Mechanical integrity will be demonstrated every 2 years during operations and will be confirmed by daily injection pressure monitoring that will be conducted per the UIC Permit once the well is operational. The SAPT for well I-01 is summarized below.

The SAPT was conducted by installing an inflatable straddle packer assembly in the well. The bottom packer was installed near the bottom of the FRP-cased portion of the well, the top packer was near the surface, the packers were inflated to form a seal against the casing. The bottom 5 feet of the packer drop pipe was perforated to allow for communication between the tubing and the annulus of the packer assembly. The drop pipe extended through the wellhead and a high pressure/low volume pump was

attached to the drop pipe to pressurize the test interval. A valve on the drop pipe at the surface was used to isolate the test interval once the planned test pressure was achieved.

An In-Situ LevelTROLL® pressure transducer with a data logger was installed at the well head and was connected to the packer assembly annulus interval via a National Pipe Thread adapter. The LevelTROLL was used to monitor and record pressure inside the well during the SAPT. To conduct the SAPT, water was pumped from a nearby well immediately prior to testing. Before the water was pumped into the test well, the water temperature was measured to ensure that it was similar to the ambient groundwater temperature of the test well to reduce the potential of differential temperature effects on the well casing. The SAPT for the Class III well was conducted by applying hydraulic pressure to the well casing and shutting in pressure between the packer and wellhead assembly, monitoring the shut-in pressure for a 30-minute period, then measuring the volume of water returned from the well casing after the pressure was released.

On 25 April 2018, the packer was installed to approximately 504 feet and the SAPT was conducted successfully three times. The USEPA SAPT form, a table of the data, and a chart of the data is provided in Appendix F.

Part II mechanical integrity is demonstrated by the cementing records included in this report (in accordance with Part II.E.3.ii.C of the UIC Permit) and will be demonstrated during operations by annular conductivity monitoring on the observation and multi-level sampling wells (in accordance with Part II.E.3.a.ii.A of the UIC Permit).

Cemented Interval	Cement Type	Calculated Grout Volume (cubic yards)	Installed Grout Volume (cubic yards)
Surface casing	Type V 21 sack neat cement slurry	2.6	3.5
Overburden casing	Type V 21 sack neat cement slurry	26.3	31.6
Well casing	Type V 21 sack neat cement slurry	15.5	16.8

On 7 December 2017, a cement bond log was run on the overburden casing. On 26 April 2018, a suite of logs was run over the entire length of the completed well to verify the grout seal; a geophysical log summary figure of the logs completed to demonstrate cement bond are included in Appendix G.

The cement bond of the steel casing was evaluated by the geophysical contractor by calculating a bond index. The bond index based on the cement bond log was calculated to be an average of 86 percent over the cement grouted interval from 11 to 501 feet; this data is included on the summary log in Appendix G. A sonic log was also run in the steel casing and the results of the sonic log indicate a consistent density in the interval which supports the cement bond log data.

There is not a bond log tool designed to evaluate cement bond with FRP casing, so the cement interval with the FRP casing was evaluated using density logs. Based on the measured density of the cased interval, no significant cement deficiencies were noted in the sonic data collected from the water table

at approximately 231 to 493 feet, and no significant deficiencies were noted in the 4pi density data collected from 15 to 493 feet. There were some very localized, low density intervals identified in the density logs but they were insignificant, only extending 2 to 3 feet. A summary of the FRP cased data is included in the well completion summary in Appendix G.

VIII. Compatibility of Injected Waste

The Florence Copper Project is a Class III mineral extraction project and does not include the injection of any waste products of any kind. The injected fluid (lixiviant) is a carefully constituted in-situ copper recovery solution that will be recovered and recycled following injection.

The compatibility of the lixiviant was evaluated as part of the geochemical modeling completed by Florence Copper and summarized in the *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona* (Daniel B. Stephens, May 2014) which was included in Attachment H of the UIC Permit Application.

IX. Status of Corrective Action on Defective Wells in the Area of Review

There are not currently any defective wells in the AOR.

X. Maximum Pressures and Flow Rates for I-01

Maximum Operating Pressure	Maximum Flow (Injection)
104 PSI	60 gpm
Notes: *gpm = gallons per minutes* *psi = pounds per square inch*	

The maximum operating pressure was calculated using the permitted fracture gradient limit of 0.65 psi/foot and the estimated weight of the mature raffinate solution of 0.45 psi/foot. This well is an injection well used to inject solution and the permitted maximum injection flow rate is 60 gallons per minute (gpm).

XI. Well Development

Well I-01 was developed by the airlift method, followed by pumping; development was completed by Hydro Resources using a workover rig. To purge drilling fluids and solids, the well was airlift developed from 4 to 9 April 2018 at depths ranging from 600 to 1,200 feet. During development, the airlift pump was cycled to surge the well. On 7 April 2018, approximately 33 gallons of chlorine were added to the

well to break down the polymer mud used during drilling and to aid in well development. The discharge was cloudy and sand-free after approximately 52 hours of airlift development.

A submersible pump was temporarily installed at approximately 763 feet on 10 April 2018 for use in well development. Prior to pumping, the static water level was approximately 230 feet. Pump development was conducted at approximately 60 to 65 gpm from 10 to 11 April 2018, during which time the submersible pump was periodically cycled to surge the well and the pump was raised in the well as discharge cleared. The discharge was visually clear throughout the pump development period, and turbidity values were less than 5 Nephelometric Turbidity Units at the end of the development period and discharge was free of chlorine. Well development forms are included in Appendix H.

XII. Well Completion

A well video survey was conducted on 17 April 2018; the video log report is included as Appendix I**.** The video log depths are presented in feet below the top of the casing and thus vary slightly from what is recorded; however, these values are the same with the correction for stick up.

The video log indicates the total depth reached was 1,194 feet (to the top of soft fill).

A gyroscopic survey was also conducted on the completed well on 7 May 2018; the results are included in Appendix I.

The surveyed location for well I-01 is as follows:

Northing (feet)	Easting (feet)	Measuring Point Elevation (feet amsl)
746202.46	847694.70	1482.67
***Notes**:* *Northing and easting locations provided in State Plane North American Datum 1983; vertical location provided in North American Vertical Datum 1988.* *amsl = above mean sea level*		

XIII. Downhole Equipment

On 17 July 2018, the permanent equipment was installed in the well. The equipment installed includes:

- Inflatable Packers International packer;
- 2-inch Schedule 120 threaded and coupled polyvinyl chloride (PVC) column pipe with 316L stainless steel couplers from the packer to approximately 350 feet;
- 2-inch Schedule 40 threaded and coupled 316L stainless steel column pipe with 316L stainless steel couplers from approximately 300 feet to the wellhead;

- Pressure transducer in the well above the packer, and pressure transducer in communication with the zone below the packer through a feed-through port on the packer; and
- 1-inch nominal diameter sounding tube to 500 feet.

The type and depth of equipment installed in each well is not constrained by the UIC Permit or the Aquifer Protection Permit (APP). This information is provided in accordance with Section 2.7.4.3 of the APP. Operational considerations may require that the type and depth of equipment be changed in response to conditions observed during operations.

XIV. References

Brown and Caldwell, Inc., 2018. *PTF Mine Block Ambient Groundwater Concentrations and Initial Discharge Characterization of the Underground Workings*. Prepared for Florence Copper. August.

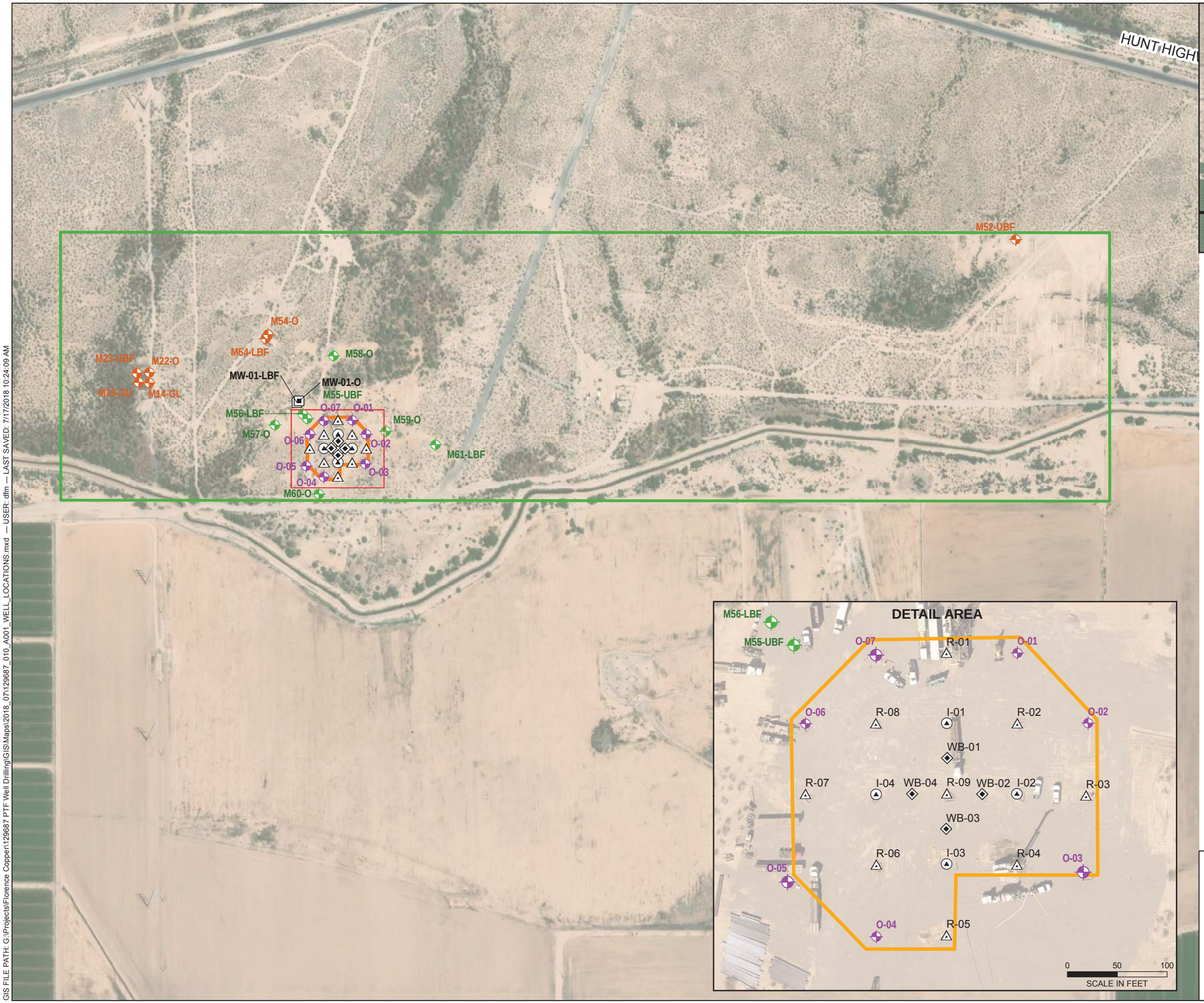
Daniel B. Stephens, Inc., 2014. *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona.* Prepared for Florence Copper. May.

Haley & Aldrich, Inc., 2017. *Well Specification: Drilling, Installation, and Testing of Class III Injection and Recovery Wells, Production Test Facility, Florence, Arizona*. Revised September 2017.

Enclosures:

Figure 1 – Well Locations
Figure 2 – Injection Well Head Detail
Figure 3 – Geophysical Data and Lithologic Log
Figure 4 – Well I-01 As-Built Diagram
Appendix A – Arizona Department of Water Resources Well Registry Report
Appendix B – Lithologic Log
Appendix C – Chemical Characteristics of Formation Water
Appendix D – Well Completion Documentation
Appendix E –Geophysical Logs
Appendix F – SAPT Documentation
Appendix G – Cement Bond Log Summary
Appendix H – Well Development Field Forms
Appendix I – Well Video Log and Gyroscopic Survey Reports

FIGURES



0 1,250 2,500
SCALE IN FEET

LEGEND

- OBSERVATION WELL
- SUPPLEMENTAL MONITORING WELL
- POINT-OF-COMPLIANCE WELL

PTF WELL

- INJECTION
- RECOVERY
- WESTBAY WELL
- OPERATIONAL MONITORING
- PTF WELL FIELD
- STATE LAND LEASE

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI

N

0 500 1,000
SCALE IN FEET

HALEY ALDRICH

FLORENCE COPPER PROJECT
FLORENCE, ARIZONA

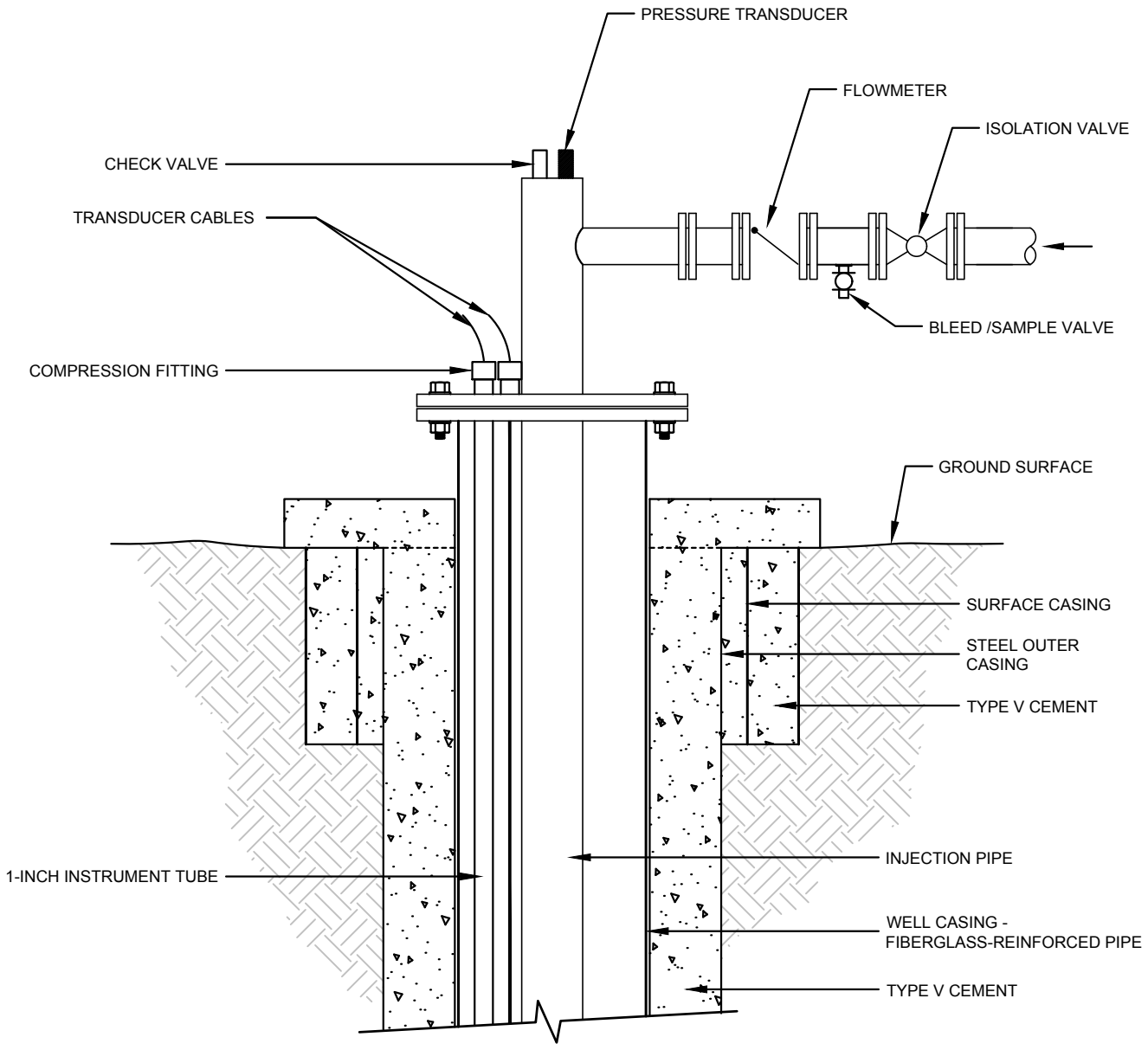
WELL LOCATIONS

FLORENCE COPPER INC.

AUGUST 2018

FIGURE 1

GIS FILE PATH: G:\Projects\Florence Copper\129687 PTF Well Drilling\GIS\Maps\2018_07\129687_010_A001_WELL_LOCATIONS.mxd — USER: dfm — LAST SAVED: 7/17/2018 10:24:09 AM



HALEY ALDRICH

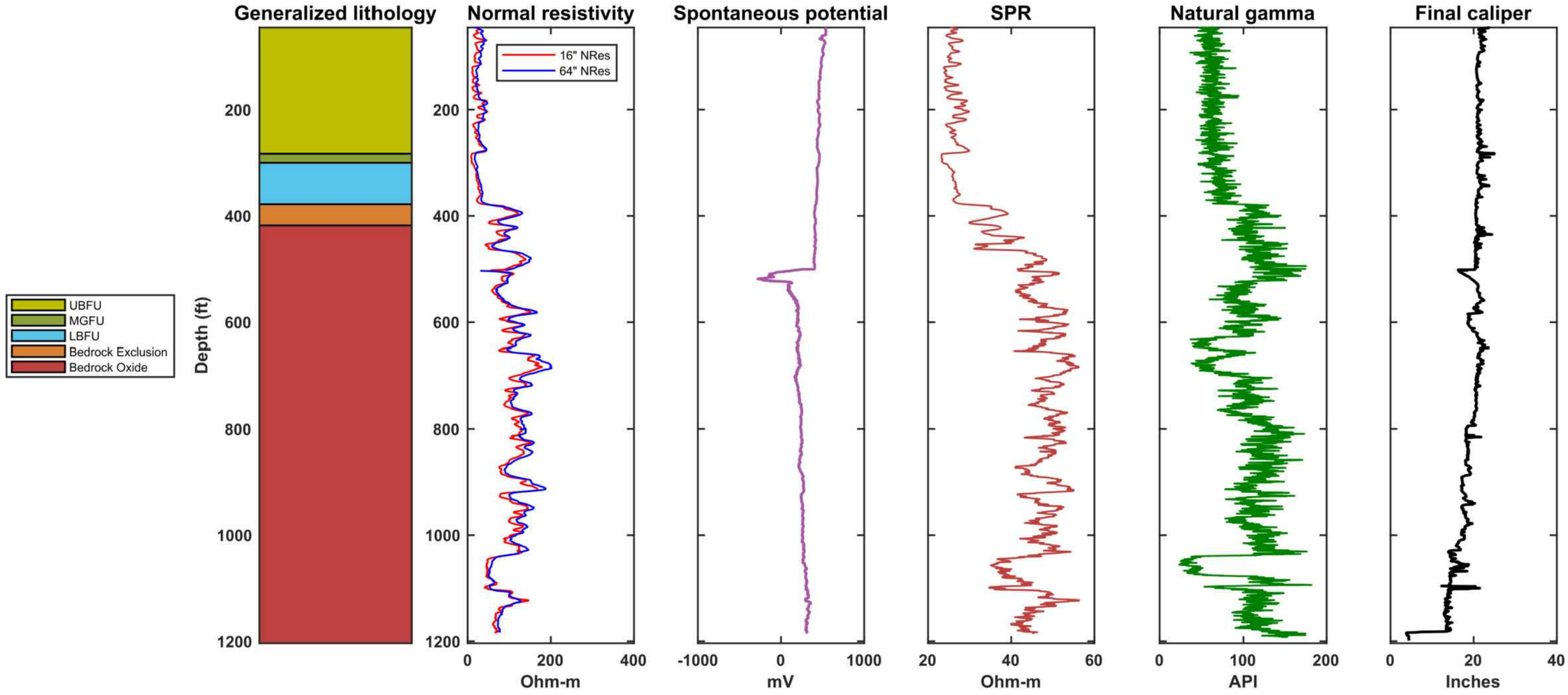
PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

INJECTION WELL HEAD DETAIL

FLORENCE COPPER INC.

SCALE: NOT TO SCALE
SEPTEMBER 2018

FIGURE 2



HALEY ALDRICH

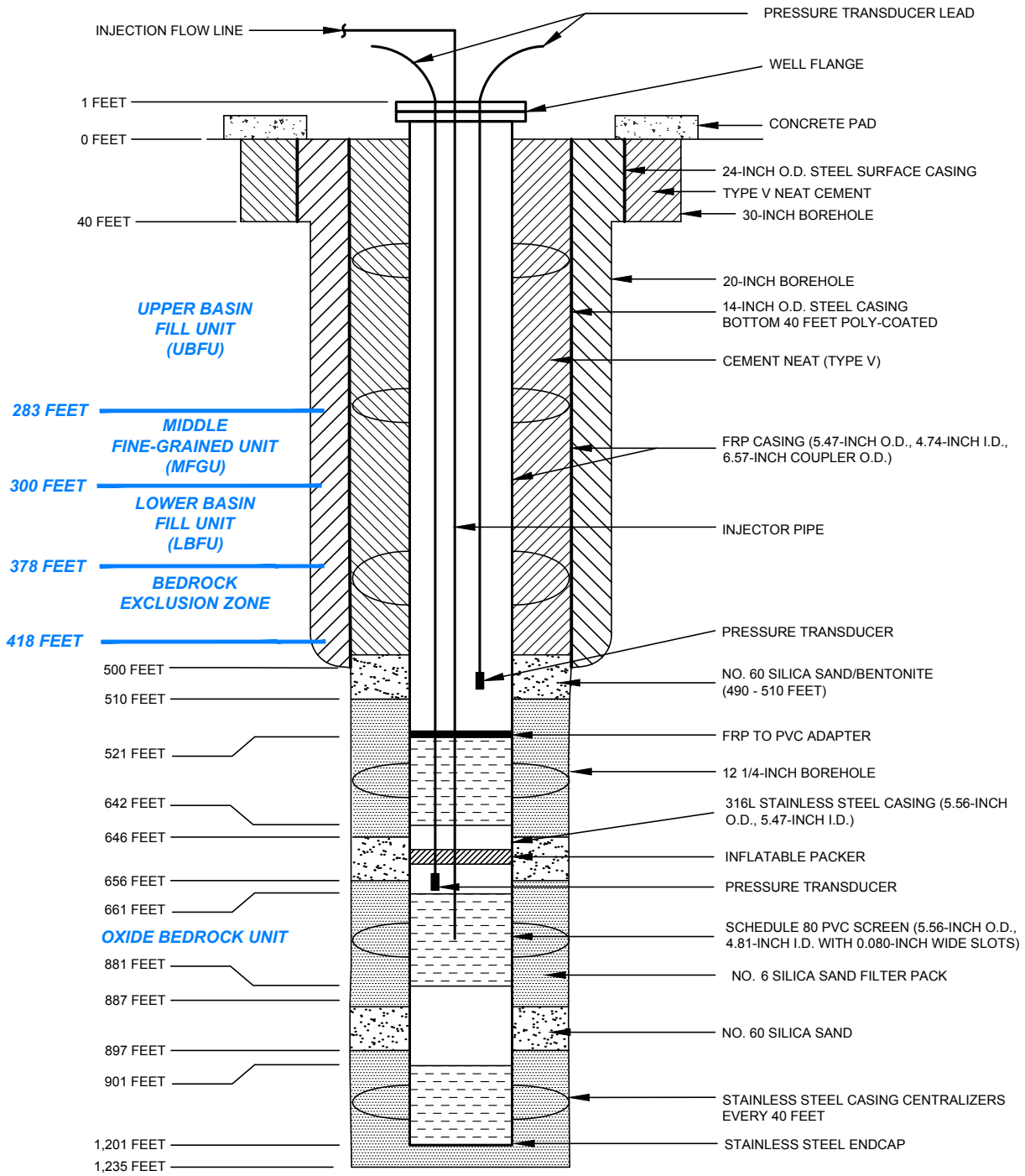
PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

INJECTION WELL I-O1
GEOPHYSICAL DATA AND LITHOLOGIC LOG

FLORENCE COPPER

SCALE: AS SHOWN
SEPTEMBER 2018

FIGURE 3



NOTES

1. WELL REGISTRATION NO.: 55-227963
2. CADASTRAL LOCATION: D(4-9) 28 CAC
3. MEASURING POINT ELEVATION: 1482.67 FEET AMSL
4. I.D. = INSIDE DIAMETER
5. O.D. = OUTSIDE DIAMETER
6. PVC = POLYVINYL CHLORIDE
7. FRP = FIBERGLASS REINFORCED PLASTIC
8. SOUNDING TUBE INSTALLED TO ~500 FEET

HALEY ALDRICH

PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

INJECTION WELL I-01 AS-BUILT DIAGRAM

FLORENCE COPPER

SCALE: NOT TO SCALE
SEPTEMBER 2018

FIGURE 4

APPENDIX A

Arizona Department of Water Resources Well Registry Report

Arizona Department of Water Resources
Water Management Division
P.O. Box 36020 Phoenix, Arizona 85067-6020
(602) 771-8627 • (602) 771-8690 fax
· www.azwater.gov ·

Well Driller Report and Well Log

CJ

THIS REPORT MUST BE FILED WITHIN **30 DAYS** OF COMPLETING THE WELL.

PLEASE PRINT CLEARLY USING BLACK OR BLUE INK.

FILE NUMBER: D (4-9) 28 CAC
WELL REGISTRATION NUMBER: **55 -** 227963
PERMIT NUMBER (IF ISSUED):

SECTION 1. DRILLING AUTHORIZATION

Drilling Firm

Mail To:

NAME	DWR LICENSE NUMBER
Hydro Resources Inc.	816
ADDRESS	TELEPHONE NUMBER
13027 County Rd. 18 Unit C	(303) 857-7544
CITY / STATE / ZIP	FAX
Ft. Lupton, CO 80621	(303) 857-2826

SECTION 2. REGISTRY INFORMATION

Well Owner

FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL: Florence Copper Inc.

MAILING ADDRESS: 1575 W. Hunt Hwy

CITY / STATE / ZIP CODE: Florence, AZ 85132

CONTACT PERSON NAME AND TITLE: Ian Ream - Sr. Hydrologist

TELEPHONE NUMBER: (520) 374-3984 FAX:

WELL NAME (e.g., MW-1, PZ-3, Lot 25 Well, Smith Well, etc.): I - 01

Location of Well

WELL LOCATION ADDRESS (IF ANY):

TOWNSHIP (N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE
4S	9E	28	SW ¼	NE ¼	SW ¼

LATITUDE			LONGITUDE		
33 ° Degrees	3 ' Minutes	1.41 "N Seconds	-111 ° Degrees	26 ' Minutes	4.67 "W Seconds

METHOD OF LATITUDE/LONGITUDE (CHECK ONE)
☒ *GPS: Hand-Held ☐ *GPS: Survey-Grade

LAND SURFACE ELEVATION AT WELL: 1492 Feet Above Sea Level

METHOD OF ELEVATION (CHECK ONE)
☒ *GPS: Hand-Held ☐ *GPS: Survey-Grade

*GEOGRAPHIC COORDINATE DATUM (CHECK ONE)
☒ NAD-83 ☐ Other (*please specify*):

COUNTY: PINAL

ASSESSOR'S PARCEL ID NUMBER: BOOK | MAP | PARCEL

SECTION 3. WELL CONSTRUCTION DETAILS

Drill Method

CHECK ALL THAT APPLY
- ☐ Air Rotary
- ☐ Bored or Augered
- ☐ Cable Tool
- ☐ Dual Rotary
- ☒ Mud Rotary
- ☒ Reverse Circulation
- ☐ Driven
- ☐ Jetted
- ☐ Air Percussion / Odex Tubing
- ☐ Other *(please specify):*

Method of Well Development

CHECK ALL THAT APPLY
- ☒ Airlift
- ☐ Bail
- ☒ Surge Block
- ☐ Surge Pump
- ☐ Other *(please specify):*

Condition of Well

CHECK ONE
- ☒ Capped
- ☐ Pump Installed

Method of Sealing at Reduction Points

CHECK ONE
- ☐ None
- ☐ Packed
- ☐ Swedged
- ☐ Welded
- ☐ Other *(please specify):*

Construction Dates

DATE WELL CONSTRUCTION STARTED: 11/01/2018

DATE WELL CONSTRUCTION COMPLETED: 05/22/2018

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and belief.

SIGNATURE OF QUALIFYING PARTY: [signature] DATE: 5/22/2018

Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55 - 227963

SECTION 4. WELL CONSTRUCTION DESIGN (AS BUILT) (attach additional page if needed)

Depth

DEPTH OF BORING		DEPTH OF COMPLETED WELL	
1235	Feet Below Land Surface	1201	Feet Below Land Surface

Water Level Information

STATIC WATER LEVEL		DATE MEASURED	TIME MEASURED	IF FLOWING WELL, METHOD OF FLOW REGULATION
232	Feet Below Land Surface	04/26/2018	1 PM	☐ Valve ☐ Other:

Borehole

DEPTH FROM SURFACE		BOREHOLE DIAMETER (inches)
FROM (feet)	TO (feet)	
0	40	30
40	492	20
492	1235	12.25

Installed Casing

DEPTH FROM SURFACE		OUTER DIAMETER (inches)	MATERIAL TYPE (T)				PERFORATION TYPE (T)						SLOT SIZE IF ANY (inches)
FROM (feet)	TO (feet)		STEEL	PVC	ABS	IF OTHER TYPE, DESCRIBE	BLANK OR NONE	WIRE WRAP	SHUTTER SCREEN	MILLS KNIFE	SLOTTED	IF OTHER TYPE, DESCRIBE	
0	40	24.5	X				X						
0	492	14.5	X				X						
0	521	5.44				FRP	X						
521	642	5.56		X							X		.080
642	661	5.56		X			X						
661	881	5.56		X							X		.080
881	901	5.56		X			X						
901	1201	5.56		X							X		.080

Installed Annular Material

DEPTH FROM SURFACE		ANNULAR MATERIAL TYPE (T)								FILTER PACK		
						BENTONITE						
FROM (feet)	TO (feet)	NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	GROUT	CHIPS	PELLETS	IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE	SAND	GRAVEL	SIZE
0	40			X								
0	492			X								
492	510							X				
510	646									X		6-9
646	656							X				
656	887									X		6-9
887	896							X				
896	1235									X		6-9

Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55 - 227963

SECTION 5. GEOLOGIC LOG OF WELL

DEPTH FROM SURFACE		Description	Check (T) every interval where water was encountered (if known)
FROM (feet)	TO (feet)	Describe material, grain size, color, etc.	
0	283	UPPER BASIN FILL UNIT	
283	300	MIDDLE FINE GRAINED UNIT	
300	378		
378	1235	BEDROCK OXIDE UNIT	

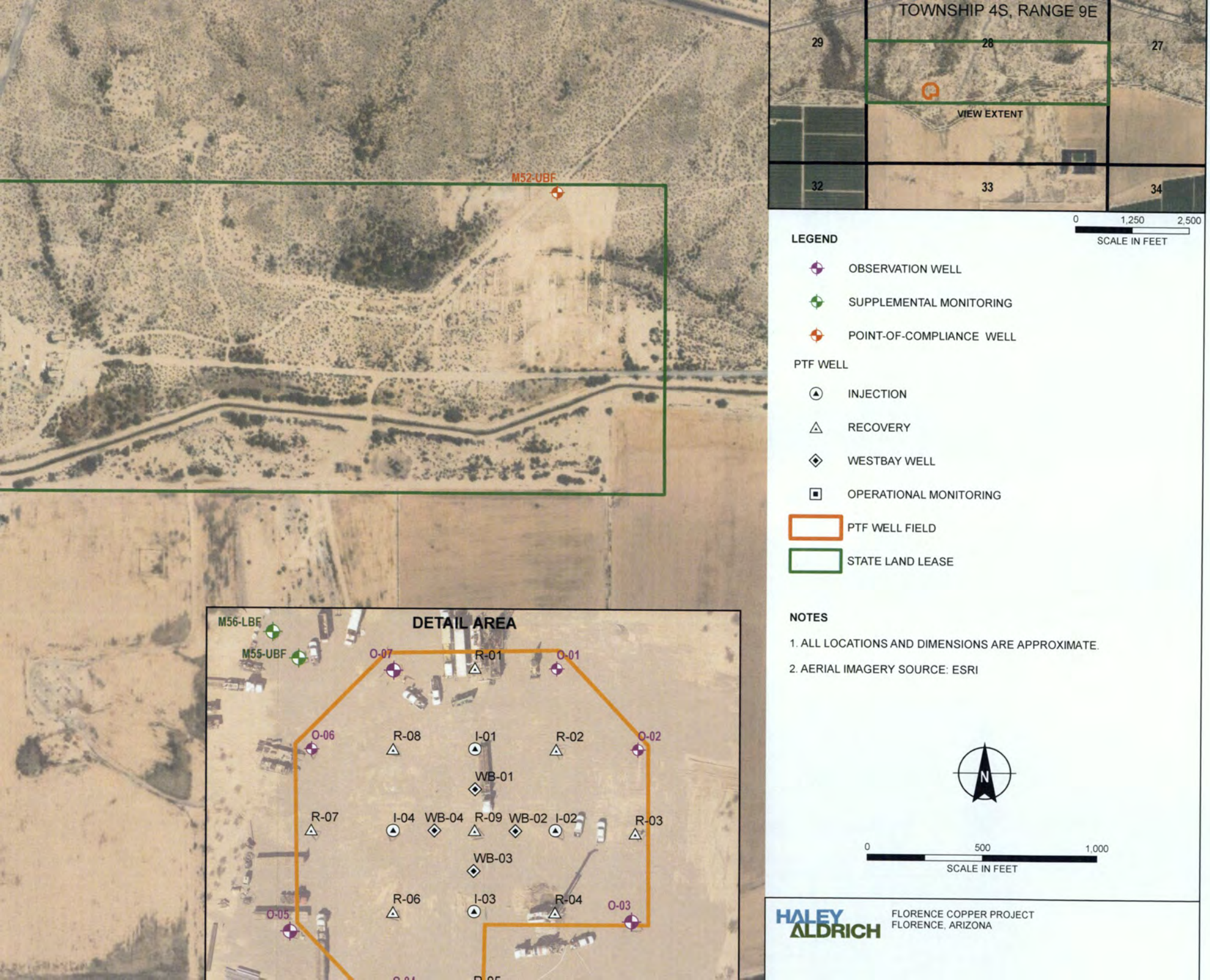
Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55 - 227963

SECTION 6. WELL SITE PLAN

NAME OF WELL OWNER	COUNTY ASSESSOR'S PARCEL ID NUMBER		
Florence Copper Inc.	BOOK	MAP	PARCEL

- ❖ Please draw the following: (1) the boundaries of property on which the well was located; (2) the well location; (3) the locations of all septic tank systems and sewer systems on the property or within 100 feet of the well location, even if on neighboring properties; and (4) any permanent structures on the property that may aid in locating the well.
- ❖ Please indicate the distance between the well location and any septic tank system or sewer system.


TOWNSHIP 4S, RANGE 9E
29
28
27
VIEW EXTENT
32
33
34
M52-UBF
DETAIL AREA
M56-LBF
M55-UBF
O-07
R-01
O-01
O-06
R-08
I-01
R-02
O-02
WB-01
R-07
I-04
WB-04
R-09
WB-02
I-02
R-03
WB-03
R-06
I-03
R-04
O-03
O-05
0
1,250
2,500
SCALE IN FEET
LEGEND
OBSERVATION WELL
SUPPLEMENTAL MONITORING
POINT-OF-COMPLIANCE WELL
PTF WELL
INJECTION
RECOVERY
WESTBAY WELL
OPERATIONAL MONITORING
PTF WELL FIELD
STATE LAND LEASE
NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI
N
0
500
1,000
SCALE IN FEET
HALEY ALDRICH
FLORENCE COPPER PROJECT
FLORENCE, ARIZONA

Run Date: 11/08/2017

AZ DEPARTMENT OF WATER RESOURCES

WELL REGISTRY REPORT - WELLS55

Location	Well Reg.No	
D 4.0 9.0 28 C A C	55 - 227963	AMA PINAL AMA

Registered Name FLORENCE COPPER INC
1575 W HUNT HWY
FLORENCE AZ 85132

File Type NEW WELLS (INTENTS OR APPLICATIONS)
Application/Issue Date 10/17/2017

Owner OWNER
Driller No. 816
Driller Name HYDRO RESOURCES - ROCKY MOUNTAIN, INC.
Driller Phone 303-857-7540
County PINAL
Parcel No. 200-31-020
Intended Capacity GPM 0.00

Well Type ENV - INJECTION
SubBasin ELOY
Watershed UPPER GILA RIVER
Registered Water Uses INDUSTRIAL
Registered Well Uses RECHARGE
Discharge Method NO DISCHARGE METHOD LISTED
Power NO POWER CODE LISTED

Well Depth	0.00	**Case Diam**	0.00	**Tested Cap**	0.00
Pump Cap.	0.00	**Case Depth**	0.00	**CRT**	
Draw Down	0.00	**Water Level**	0.00	**Log**	
		Acres Irrig	0.00	**Finish**	NO CASING CODE LISTED

Contamination Site: NO - NOT IN ANY REMEDIAL ACTION SITE

Tribe: Not in a tribal zone

Comments

Current Action

11/7/2017 555 DRILLER & OWNER PACKETS MAILED
Action Comment: JRN

Action History

11/7/2017 550 DRILLING AUTHORITY ISSUED
Action Comment: JRN

10/17/2017 310 NOI RCVD TO DEEP/MOD/REPL A NON-EXEMPT WELL (S.T. PRE-CODE, 59)
Action Comment: JRN

DOUGLAS A. DUCEY
Governor

THOMAS BUSCHATZKE
Director

ARIZONA DEPARTMENT of WATER RESOURCES
1110 West Washington Street, Suite 310
Phoenix, Arizona 85007
602.771.8500
azwater.gov

November 7, 2017

Ian Ream
Florence Copper, Inc.
1575 W. Hunt Hwy
Florence, AZ 85132

RE: Notice of Intention to Drill a Non-Exempt Well Pursuant to a Non-General Industrial Use Permit
Permit No. 59-562120.0005, Well Registration No. 55-227963;
File No. D(4-9)28 CAC

Dear Mr. Ream:

The above-referenced Notice of Intention to Drill a Non-Exempt Well Pursuant to a Non-General Industrial Use Permit in an Active Management Area (AMA) has been approved. A copy of the Notice is enclosed for your records. The drilling card for the modification of the above referenced well has been forwarded to your well driller.

In the event that the location of the proposed well changes, you must notify the Department of Water Resources of the change in writing. A drill card with the correct proposed well location must be in possession of the driller before drilling may commence. If the proposed new well is to be more than 660 feet from the well that it is replacing, then you may be required to obtain a well permit.

Within 30 days of completion of the well, the well driller is required to furnish this Department with a complete and accurate log of the well. In addition, the well owner is required to submit the enclosed Completion Report within 30 days of installation of pump equipment.

Pursuant to the provisions of A.R.S. § 45-604, any person withdrawing groundwater from a well is required to use a water measuring device to record rates of withdrawal in order to provide or allow the computation of an annual volume of pumpage from the well. The total volume of pumpage from the well which is being replaced and the completed new well shall be reported on your Annual Water Withdrawal and Use Report for calendar year 2017. Subsequent annual reporting periods shall be from January 1 through December 31.

The Department has issued the authorization to drill this well pursuant to A.R.S. §§ 45-596 and 45-597 of the Groundwater Code. The legal nature of the water withdrawn from the well may be the subject of court action in the future as part of a determination of surface water rights in your area. If there are court proceedings that could affect your well, you will be notified and be given the opportunity to participate.

Under A.R.S. § 45-593, the person to whom a well is registered must notify the Department of a change in ownership, physical characteristics or any other data about the well in order to keep the well registration records current and accurate. Forms may be obtained by contacting the Department or online at http://www.azwater.gov.

If you have any questions regarding your permit or require any administrative corrections, please the Groundwater Permitting and Wells Unit at 602-771-8527.

Sincerely,

Jacob Nelson
Groundwater Permitting and Wells Unit

Enclosures

ARIZONA DEPARTMENT OF WATER RESOURCES
WATER MANAGEMENT DIVISION
1110 West Washington Street, Suite 310, Phoenix, AZ 85007

THIS AUTHORIZATION SHALL BE IN THE POSSESSION OF THE DRILLER DURING ALL DRILL OPERATIONS

WELL REGISTRATION NO: 55-227963 **PERMIT NO.:** 59-562120.0005

AUTHORIZED DRILLER: Hydro Resources **LICENSE NO.:** 816

A PERMIT TO DRILL A NON-EXEMPT WELL INSIDE THE PINAL ACTIVE MANAGEMENT AREA HAS BEEN GRANTED TO:

WELL OWNER: Florence Copper 1575 W. Hunt Highway Florence, AZ 85132

The well(s) is/are to be located in the:

SW ¼ of the NE ¼ of the SW ¼ of Section 28 Township 4 South, Range 9 East

No. of well(s) in this project: 1

THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE 16th DAY OF October 2018

Stella Morris

GROUNDWATER PERMITTING AND WELLS

THE DRILLER MUST FILE A LOG OF THE WELL
WITHIN 30 DAYS OF COMPLETION OF DRILLING

GREAT SEAL OF THE STATE OF ARIZONA
DITAT DEUS
1912

Memorandum

To:	Jacob Nelson, Groundwater Permitting and Wells
From:	Phil Whitmore, Groundwater Permitting and Wells
CC:	Jeff Tannler, Statewide AMA Director
Date:	10/24/2017
Subject:	Review of Application for a Permit to Drill or Operate Four Non-exempt Wells within an Active Management Area 59-562120 55-227963-6 D(4-9)28CAC & CBD Florence Copper, Inc.

ADWR has reviewed the above-referenced applications for four (4) permits to drill and operate non-exempt wells in the Pinal AMA. This hydrologist review is limited to conformance with well construction standards only.

The applicant proposes to inject 96.8 acre-feet per year from 4 new wells and add them to the applicant's Mineral Extraction Withdrawal permit (59-562120.0005).

Well Construction

The applicant proposes that all four (4) wells will be drilled and constructed in the same manner and drill depths. Each well will be 1210 feet deep with three (3) 200-foot screen intervals all open in the bedrock aquifer only. They will have 5-inch diameter inner casing constructed with PVC and include elements to reduce chemical corrosion.

The applications each included proposed well construction diagrams indicating that the outer annulus of the wells will be sealed from the surface to 20 feet below land surface and an inner annulus will be sealed to 490 below land surface. The estimated contact of the lower basin fill unit and the crystalline bedrock is approximately 490 feet deep.

The well diagrams did not indicate the height of well stick up and the applicant did not include a request for variance. However, if stick up is to be less than 1 foot above land surface a request for variance should be submitted to comply with Arizona Administrative Code R12-15-820.

Conclusion

We recommend issuing a permit to drill and operate all four (4) non-exempt wells in the proposed location, at the volume and well construction specifications stated in the application.

HALEY ALDRICH

Letter of Transmittal

Haley & Aldrich, Inc.
One Arizona Center
400 E. Van Buren St., Suite 545
Phoenix, AZ 85004

Date	16 October 2017
File Number	129687
From	Lauren Candreva

To	Arizona Department of Water Resources 1110 W. Washington Suite 310 Phoenix, Arizona 85007
Attention	Groundwater and Well Permitting Section
Subject	Florence Copper, Inc.

Copies	Date	Description
4	October 2017	Notice of Intent to Install a New Well

Transmitted via ☐ First class mail ☐ Overnight express ☒ Hand delivery ☐ Other

Remarks

ARIZONA DEPARTMENT OF WATER RESOURCES
GROUNDWATER PERMITTING AND WELLS UNIT
MAIL TO: P.O. BOX 36020, PHOENIX, ARIZONA 85067-6020
1110 W. Washington St. Suite 310, Phoenix, Arizona 85007-2952
Phone (602) 771-8527 Fax (602) 771-8590

NOTICE OF INTENTION TO DRILL A NON-EXEMPT WELL PURSUANT TO A GROUNDWATER WITHDRAWAL PERMIT (OTHER THAN A GENERAL INDUSTRIAL USE PERMIT) IN AN ACTIVE MANAGEMENT AREA

PLEASE READ GENERAL INSTRUCTIONS AND CONDITIONS ON REVERSE SIDE OF THIS FORM BEFORE COMPLETING.
Section § 45-598, Arizona Revised Statutes provides: In an Active Management Area, prior to drilling a well, a person entitled to withdraw groundwater shall file a Notice of Intention to Drill with the Department. Pursuant to A.R.S. § 45-596 and A.A.C. R12-15-104, the filing fee for this application is $150.00.

1. **WELL/LAND LOCATION:**
   4S (Township) N/S 9E (Range) E/W 28 (Section)
   SW (10 Acre) ¼ NE (40 Acre) ¼ SW (160 Acre) ¼

2. **POSITION LOCATION OF THE WELL:**
   Latitude 33 ° 3 '1.39" N
   Longitude 111 ° 26 '4.69" W

3. **COUNTY** Pinal

4. **APPLICANT**
   Florence Copper, Inc.
   Name
   1575 W Hunt Hwy
   Mailing Address
   Florence AZ 85132
   City State Zip
   Telephone No. 520-374-3984

5. **OWNER OF THE LAND OF WELLSITE:**
   AZ State Land (Mineral Lease #11-026500)
   Name
   1616 W Adams Street
   Mailing Address
   Phoenix AZ 85007
   City State Zip
   Telephone No. 602-542-4631

6. **THIS NOTICE IS FILED BY:**
   Check one: ☐ Owner ☒ Lessee
   Ian Ream
   Name
   1575 W Hunt Hwy
   Mailing Address
   Florence AZ 85132
   City State Zip

7. **DESCRIPTION OF THE PROPOSEDWELL:**
   Diameter 5 Inches
   Depth 1200 Feet
   Type of Casing Steel/FRP/PVC

8. **ESTIMATE OF TOTAL ANNUAL PUMPAGE:**
   -96.8 (INJ) Acre-feet per Year

9. **PRINCIPAL USE OF WATER** (be specific):
   Mineral Extraction

10. **OTHER USES INTENDED** (be specific):
    None

11. **CONSTRUCTION WILL START:**
    September 2017
    Month Year

FOR DEPARTMENT USE ONLY
File No. 04-928 CAC
Filed 10/17/17 By JRN
Input 11/17/17 By JRN

DUPLICATE
Mailed 11/17/17 By JRN
Registration 55- 227963
AMA/INA PINAL

12. **CLAIM OF ENTITLEMENT TO WITHDRAW GROUNDWATER:**
    Permit 59- 562120.0005

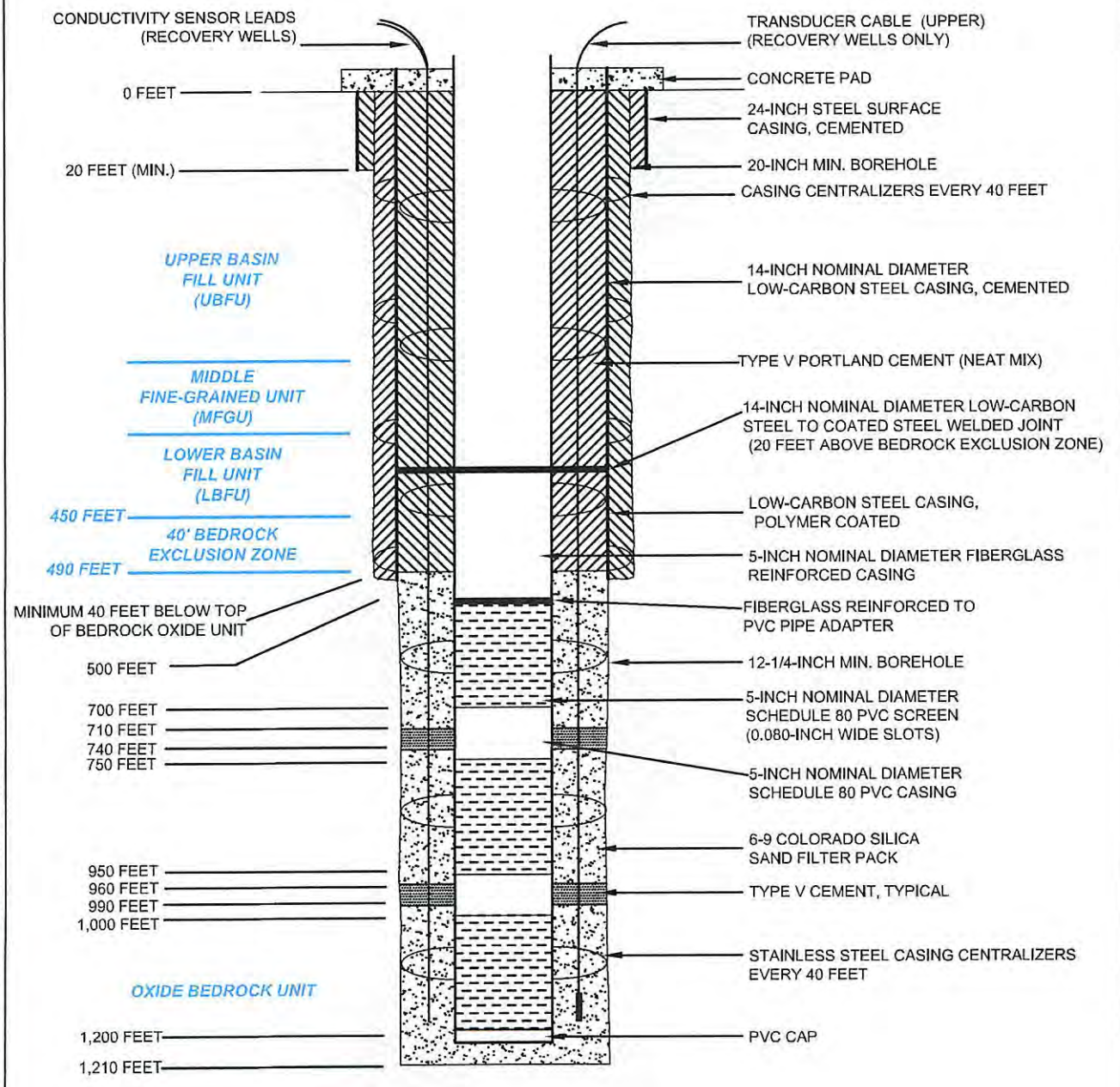
13. **DRILLING FIRM:**
    HydroResources
    Name
    13027 County Rd 18, Unit C
    Mailing Address
    Fort Lupton CO 80621
    City State Zip
    303-857-7540
    Telephone No.
    816
    DWR License Number
    A-4
    ROC License Category

14. **Is the proposed well within 100 feet of a septic tank system, sewage area, landfill, hazardous waste facility or storage area of hazardous material or a petroleum storage area and tank?** ☐ Yes ☒ No

15. **Attach a detailed construction diagram of the proposed well design. The diagram should provide verification of consistency with minimum construction requirements. Specifically, the diagram should include an indication of the perforated interval location(s) in relationship to the expected water level; the depth and thickness of the surface seal, and grouting material used; whether the surface or conductor casing will extend above grade; and vault details, if specified.**

I state that this Notice is filed in compliance with Rules A.A.C. R12-15-809 and R12-15-816(F), and is complete and correct to the best of my knowledge and belief, and that I understand the conditions set forth on the reverse side of this form.

Ian Ream | Ian Ream | Senior Hydrogeologist | 9-29-2017
Type or Print Name and | Signature ☐ Land Owner ☒ Lessee of well site | Title | Date



G:\PROJECTS\CURIS RESOURCES\38706-CURIS FEASIBILITY\DRAWINGS\2014 UIC APP\FIGURES MM-1 WELL CONST DGRM JUNE2015 UPDATE.DWG

HALEY ALDRICH

FLORENCE COPPER, INC.
FLORENCE, ARIZONA

I-01
WELL CONSTRUCTION DIAGRAM

FLORENCE COPPER INC.

SCALE: NOT TO SCALE

FIGURE 1

ARIZONA DEPARTMENT OF WATER RESOURCES

GROUNDWATER PERMITTING AND WELLS UNIT
1110 W. Washington St. Suite 310, Phoenix, Arizona 85007-2952
Phone (602) 771-8585 Fax (602) 771-8688

WELL CONSTRUCTION SUPPLEMENT (form DWR 55-90)

Well Registration Number 55- 227963

1. **Well Location:**

   SW (10AC) ¼ of the NE (40AC) ¼ of the SW (160AC) ¼, Sec. 28, Township 4S Range 9E.

2. **Position Location of the Well:**

   Latitude 33 ° 3 ' 1.39 " **Longitude** 111 ° 26 ' 4.69 "

   Datum: ✓ **NAD 83** • **NAD 27** • **Other:** _____

3. **County** PINAL.

4. **Date construction to start:** SEPTEMBER 2017.

5. **Time period well will remain in use:** 5 YEARS.

6. **Is pump equipment to be installed?** NO **If so, design pump capacity:** -60 (INJ) **GPM.**

7. **Well construction plan:**

   a. **Drilling method (mud rotary, hollow-stem auger, etc.)** MUD ROTARY.

   b. **Borehole diameters** 30 20 **inches from** 0 40 **feet to** 40 490 **feet.**

   12.25 **inches from** 490 **feet to** 1210 **feet.**

   c. **Casing materials** STEEL/FIBERGLASS REINFORCED PLASTIC/PVC.

   d. **Method of well development (bail, air lift, surge, etc.)** AIRLIFT, SURGE.

   e. **Will surface or conductor casing extend above grade?** NO.

8. **Include a detailed construction diagram of the proposed well design. The diagram should verify consistency with minimum construction requirements specified in the Department's well construction rules found in Arizona Administrative Code (A.A.C.) R12-15-801 *et seq*. Specifically, the diagram should include borehole diameters; casing materials and diameters; perforation intervals; the expected water level; depth and thickness of the surface seal; proposed grouting materials; and the length that the surface or conductor casing will extend above grade, or vault details, if specified.**

   Pursuant to Arizona Revised Statutes (A.R.S.) § 45-594.B, all well construction, replacement, deepening and abandonment operations shall comply with the rules adopted pursuant to this section. Therefore, any existing well that is deepened or modified must be brought into compliance with minimum well construction standards specified above, if not already in compliance.

9. **Proposed materials and method of abandonment if well is to be abandoned after project is completed (Minimum requirements per A.A.C. R12-15-816):**

10. Is the proposed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility, storage area of hazardous material, or petroleum storage area or tank? _____Yes __X__No

11. Is this well to monitor existing contamination? ____Yes __X__No

Potential contamination?_____Yes __X__No If yes, please provide explanation:_____

_____

12. Name of Consulting firm, if any: HALEY & ALDRICH, INC.

400 E VAN BUREN STREET | SUITE 545 | PHOENIX | AZ | 85004
Address | | City | State | Zip

Contact Person: LAUREN CANDREVA Telephone Number: 602-760-2429

13. Drilling firm HYDRORESOURCES

DWR License Number: 816 ROC License Category: A-4

14. Special construction standards, if any, required pursuant to A.A.C. R12-15-821:_____

_____

I (we), _____ hereby affirm that all information provided in this application is true and correct to the best of my/our knowledge and belief.
(print name)

Signature of Applicant _____ Date 9-29-2017

Transaction Receipt - Success

Arizona Water Resources
Arizona Water Resources
MID:347501639533
1700 W Washington St
Phoenix , AZ 85012
602-771-8454

10/17/2017 11:46AM
Remittance ID
Arizona101717144444278Nel
Transaction ID:
193090775

LAUREN A. CNADREVA
209 S. Marin Dr.
GILBERT, Arizona 85296
United States
Visa - 7664
Approval Code: 09392C

Sale
Amount: $600.00

55-227963-...966
N/A
Time Tracking
0
jnelson@azwater.gov

Cardmember acknowledges receipt of goods and/or services in the amount of the total shown hereon and agrees to perform the obligations set forth by the cardmember's agreement with the issuer.

Signature _____

click here to continue.

Printed: 10/17/2017 11:48:25 AM

Arizona Department of Water Resources

1110 West Washington Street, Suite 310
Phoenix AZ 85007

Customer:
LAUREN CANDREVA
209 S. MARIN DR.
GILBERT, AZ 85296

Receipt #: 18-54548
Office: MAIN OFFICE
Receipt Date: 10/17/2017
Sale Type: IN_PERSON
Cashier: WRJRN

Item No.	Function Code	AOBJ	Description	Ref ID	Qty	Unit Price	Ext Price
67488	122221	4439-TT	Notice of intention to drill a well other than a well described in subsection (A)(1)(h) of this Section	227963	1	150.00	150.00
					RECEIPT TOTAL:		**150.00**

Payment type: CREDIT CARD
Amount Paid: $150.00
Payment Received Date: 10/17/2017

Authorization 193090775

Notes: FROM TTA.

No refund without valid receipt

APPENDIX B

Lithologic Log

LITHOLOGIC LOG

I-01

HALEY ALDRICH

Project	Production Test Facility, Florence, Arizona		File No. 129687
Client	Florence Copper, Inc.		Sheet No. 1 of 15
Contractor	Cascade Drilling LLC		Cadastral Location D (4-9) 28 CAC
Drilling Method	Reverse Rotary	Land Surface Elevation 1479.73 feet, amsl	Start 13 February 2018
Borehole Diameter(s)	30/20/12.25 in.	Datum State Plane NAD 83	Finish 16 March 2018
Rig Make & Model	Midway 3500	Location N 746,203 E 847,695	H&A Rep. S. Kaney

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
0		SM		**SILTY SAND with GRAVEL (0-5 feet)** Primarily fine sand with ~20% fines and ~15% gravel up to 30mm. Sand is subangular to subrounded and gravel is subangular to rounded. Fines are nonplastic, no toughness, and no dry strength (7.5YR 4/4). **UBFU**	
5	1475	SW-SM	5	**WELL GRADED SAND with SILT and GRAVEL (5-24 feet)** Primarily fine to coarse sand with ~10% fines and ~15% gravel up to 160mm. Sand is subangular to subrounded and gravel is subangular to rounded. Fines are nonplastic, no toughness, and no dry strength (7.5YR 4/6). **UBFU**	**Well Registry ID:** 55-227963 **Surface Completion:** Bolted Sealed Well Flange **Well casing stickup:** 0.97 feet als *COLOR IDENTIFICATION MADE WITH WET SAMPLES USING MUNSELL CHART*
10	1470				
15	1465				
20	1460				
25	1455	SW	24	**GRAVELLY SAND with SILT (24-34 feet)** Primarily coarse to medium sand with ~5% fines and ~30% gravel greater than 300mm. Sand is subangular to subrounded and gravel is angular to rounded. Fines are nonplastic, no toughness, and no dry strength (7.5YR 4/4). **UBFU**	
30	1450				
35	1445	SP-SC	34	**POORLY GRADED SAND with CLAY (34-40 feet)** Primarily fine sand with ~30% fines and ~5% gravel up to 60mm. Sand is subangular to subrounded and gravel is subangular to rounded. Fines have medium plasticity, medium toughness, and high dry strength (7.5YR 4/4). **UBFU**	
40	1440	GW	40	**POORLY GRADED SAND with CLAY (40-50 feet)** Primarily gravel up to 20mm with ~45% sands and ~5% fines. Sand and gravel is subangular to subrounded. Fines are nonplastic, no toughness, no dry strength, are brown (7.5YR 5/4), and no reaction to HCL. **UBFU**	**Surface Casing:** 24-inch mild steel; 0 - 40 feet **Overburden Casing:** 14-inch mild steel; 0 - 506 feet **Well Casing:** Nominal 5-inch diameter Fiberglass Reinforced; -0.97 - 520 feet
45	1435				
50	1430	SW	50	**WELL GRADED SAND with GRAVEL (50-60 feet)** Primarily coarse to fine sand with ~5% fines and ~35% gravel up to 20mm. Sand and gravel is subangular to subrounded. Fines are nonplastic, no toughness, no dry strength, are brown (7.5YR 4/4), and no reaction to HCL. **UBFU**	
55	1425				
60	1420	CH	60	**FAT CLAY with SAND (60-65 feet)** Primarily fines with ~25% sands and trace gravel up to 20mm. Sand is subangular to subrounded. Fines have high plasticity, medium toughness, high dry strength, are light brown (7.5YR 6/4), and weak reaction to HCL. **UBFU**	**Unit Intervals:** UBFU: 0 - 283 feet MGFU: 283 - 300 feet LBFU: 300 - 378 feet Oxide Bedrock: 378 - 1220 feet
65	1415	SW-SM	65	**WELL GRADED SAND with SILT (65-75 feet)** Primarily coarse to fine sand with ~10% fines and ~10% gravel up to 6mm. Sand and gravel is subangular to subrounded. Fines have low plasticity, low toughness, low dry strength, are brown (7.5YR 4/4), and no reaction to HCL. **UBFU**	
70	1410				
75	1405				

NOTE: Lithologic descrptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

I-01

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
75		CH	75	**FAT CLAY with SAND (75-85 feet)** Primarily fines with ~20% sands and trace gravel up to 4mm. Sand is subangular to subrounded. Fines have high plasticity, medium toughness, high dry strength, are light brown (7.5YR 6/4), and weak reaction to HCL. **UBFU**	
80	1400				
85	1395	SW-SM	85	**WELL GRADED SAND with CLAY (85-95 feet)** Primarily coarse to fine sand with ~10% fines and ~10% gravel up to 21mm. Sand and gravel is subangular to subrounded. Fines have low plasticity, low toughness, low dry strength, are light brown (7.5YR 6/4), and no reaction to HCL. **UBFU**	
90	1390				
95	1385	CH	95	**FAT CLAY with SAND (95-110 feet)** Primarily fines with ~20% sands and ~5% gravel up to 6mm. Sand and gravel is subangular to subrounded. Fines have high plasticity, medium toughness, high dry strength, are light brown (7.5YR 6/4), and weak reaction to HCL. **UBFU**	**Seal:** Type V neat cement 0 - 492 feet Fine sand/bentonite 492 - 510 feet
100	1380				
105	1375				
110	1370	SC	110	**CLAYEY SAND (110-115 feet)** Primarily fine to coarse sand with ~30% fines and ~10% gravel up to 9mm. Sand and gravel is subangular to subrounded. Fines have high plasticity, medium toughness, high dry strength, are light brown (7.5YR 6/4), and weak reaction to HCL. **UBFU**	
115	1365	CH	115	**FAT CLAY with SAND (115-140 feet)** Primarily fines with ~20% sands and ~5% gravel up to 12mm. Sand and gravel is subangular to subrounded. Fines have high plasticity, medium toughness, high dry strength, are light brown (7.5YR 6/4), and weak reaction to HCL. **UBFU**	
120	1360				
125	1355				
130	1350				
135	1345				
140	1340	SC	140	**CLAYEY SAND (140-145 feet)** Primarily medium to fine sand with ~30% fines and ~10% gravel up to 8mm. Sand and gravel subangular to subrounded. Fines have medium plasticity, low toughness, medium dry strength, are brown (7.5YR 5/4), and weak reaction to HCL. **UBFU**	
145	1335	CH	145	**FAT CLAY with SAND (145-170 feet)** Primarily fines with ~20% sands and trace gravel up to 9mm. Sand is subangular to subrounded. Fines have high plasticity, medium toughness, high dry strength, (7.5YR 6/4), and weak reaction to HCL. **UBFU**	
150	1330				
155	1325				
160	1320				

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
165	1315			
170	1310	SC	170	**CLAYEY SAND (170-185 feet)** Primarily coarse to fine sand with ~20% fines and ~10% gravel up to 15mm. Sand and gravel is subangular to subrounded. Fines have medium plasticity, low toughness, medium dry strength, are brown (7.5YR 5/4), and weak reaction to HCL. **UBFU**
175	1305			
180	1300			
185	1295	SW-SC	185	**WELL GRADED SAND with CLAY (185-230 feet)** Primarily coarse to fine sand with ~15% fines and ~15% gravel up to 10mm. Sand and gravel is subangular to subrounded. Fines have low plasticity, low toughness, low dry strength, are brown (7.5YR 5/4), and no reaction to HCL. **UBFU**
190	1290			
195	1285			
200	1280			
205	1275			
210	1270			
215	1265			
220	1260			
225	1255			
230	1250	CH	230	**FAT CLAY with SAND (230-235 feet)** Primarily fines with ~20% sands and trace gravel up to 4mm. Sand is subangular to subrounded. Fines have high plasticity, medium toughness, high dry strength, are light brown (7.5YR 6/4), and weak reaction to HCL. **UBFU**
235	1245	SC	235	**CLAYEY SAND (235-250 feet)** Primarily fine to coarse sand with ~35% fines and ~5% gravel up to 6mm. Sand and gravel is subangular to subrounded. Fines have medium plasticity, medium toughness, medium dry strength, are brown (7.5YR 5/4), and no reaction to HCL. **UBFU**
240	1240			
245	1235			

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
250	1230	SW-SC	250	**WELL GRADED SAND with CLAY (250-283 feet)** Primarily fine to coarse sand with ~10% fines and ~10% gravel up to 20mm. Sand and gravel is subangular to subrounded. Fines have low plasticity, low toughness, low dry strength, are brown (7.5YR 5/4), and no reaction to HCL. **UBFU**
255	1225			
260	1220			
265	1215			
270	1210			
275	1205			
280	1200			
285	1195	CH	283	**FAT CLAY (283-300 feet)** Primarily fines with ~25% sands and trace gravel. Fines have high plasticity, high toughness, high dry strength, are light brown (7.5YR 6/4), and weak reaction to HCL. **MGFU**
290	1190			
295	1185			
300	1180	SC	300	**CLAYEY SAND (300-320 feet)** Primarily fine to coarse sand with ~10% fines and ~10% gravel up to 8mm. Sand and gravel is subangular to subrounded. Fines have medium plasticity, low toughness, medium dry strength, are brown (7.5YR 4/5), and weak reaction to HCL. **LBFU**
305	1175			
310	1170			
315	1165			
320	1160	SW-SC	320	**WELL GRADED SAND with CLAY and GRAVEL (320-378 feet)** Primarily coarse to fine sand with ~10% fines and ~20% gravel up to 16mm. Sand and gravel is subangular to subrounded. Fines have medium plasticity, medium toughness, medium dry strength, are brown (7.5YR 4/5), and weak reaction to HCL. **LBFU**
325	1155			
330	1150			
335	1145			

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
340	1140			
345	1135			
350	1130			
355	1125			
360	1120			
365	1115			
370	1110			
375	1105			
378			378	
380	1100			**QUARTZ MONZONITE (378-500 feet)** Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximatley 5%. Cu minerals at 465'.
385	1095			
390	1090			
395	1085			
400	1080			
405	1075			
410	1070			
415	1065			
420	1060			

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
425	1055			
430	1050			
435	1045			
440	1040			
445	1035			
450	1030			
455	1025			
460	1020			
465	1015			
470	1010			
475	1005			
480	1000			
485	995			
490	990			
495	985			
500	980		500	**GRANODIORITE (500-510 feet)** Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%.
505	975			

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
510	970		510	**QUARTZ MONZONITE (510-520 feet)** Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximatley 5%. Cu minerals at 520'	**Filter Pack:** No. 60 Silica Sand 510 - 646, 656 - 887, 897 - 1235 feet **Fine Sand Intervals:** 646 - 656, 887 - 897 feet **Thread Adapter:** Stainless Steel, SCH 80 F480 PVC to API; 520 feet
515	965				
520	960		520	**GRANODIORITE (520-570 feet)** Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%.	
525	955				
530	950				**Well Screen:** Nominal 5-inch diameter, SCH 80 PVC Screen (0.080-inch slots); 521 - 642, 661 - 881, 901 - 1201 feet
535	945				
540	940				
545	935				
550	930				
555	925				
560	920				
565	915				
570	910		570	**GRANODIORITE (570-590 feet)** Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%.	
575	905				
580	900				
585	895				
590	890		590	**QUARTZ MONZONITE (590-625 feet)** Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximatley 5%.	
595	885				

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
600	880			
605	875			
610	870			
615	865			
620	860			
625	855		625	**GRANODIORITE (625-630 feet)** Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%.
630	850		630	**DIABASE (630-655 feet)** Dark gray to black igneous rock.
635	845			
640	840			
645	835			
650	830			
655	825		655	**GRANODIORITE (655-670 feet)** Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%.
660	820			
665	815			
670	810		670	**DIABASE (670-695 feet)** Dark gray to black igneous rock.
675	805			
680	800			

NOTE: Lithologic descrptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
685	795			
690	790			
695	785		695	**GRANODIORITE (695-850 feet)** Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%. 760'-770' has reddish tinge.
700	780			
705	775			
710	770			
715	765			
720	760			
725	755			
730	750			
735	745			
740	740			
745	735			
750	730			
755	725			
760	720		760	**GRANODIORITE (695-850 feet)** Continued
765	715			

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
770	710			
775	705			
780	700			
785	695			
790	690			
795	685			
800	680			
805	675			
810	670			
815	665			
820	660			
825	655			
830	650			
835	645			
840	640			
845	635			
850	630		850	**DIABASE (850-855 feet)** Dark gray to black igneous rock.
855	625		855	**GRANODIORITE (855-970 feet)** Contains mostly plagioclase in a gray aphanitic matrix

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
				with biotite crystals composing approximately 10%. 970'-985' reddish pink.
860	620			
865	615			
870	610			
875	605			
880	600			
885	595			
890	590			
895	585			
900	580			
905	575			
910	570			
915	565			
920	560			
925	555			
930	550			
935	545			
940	540			

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
945	535			
950	530			
955	525			
960	520			
965	515			
970	510		970	**QUARTZ MONZONITE (970-1040 feet)** Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximatley 5%.
975	505			
980	500			
985	495			
990	490			
995	485			
1000	480			
1005	475			
1010	470			
1015	465			
1020	460			
1025	455			
	450			

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
1030				
1035	445			
1040	440		1040	**GRANODIORITE (1040-1080 feet)** Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%. Abundance of clay.
1045	435			
1050	430			
1055	425			
1060	420			
1065	415			
1070	410			
1075	405			
1080	400		1080	**QUARTZ MONZONITE (1080-1190 feet)** Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximatley 5%.
1085	395			
1090	390			
1095	385			
1100	380			
1105	375			
1110	370			
1115	365			

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
			1117	**QUARTZ MONZONITE (1080-1190 feet)** Continued
1120	360			
1125	355			
1130	350			
1135	345			
1140	340			
1145	335			
1150	330			
1155	325			
1160	320			
1165	315			
1170	310			
1175	305			
1180	300			
1185	295			
1190	290		1190	**GRANODIORITE (1190-1220 feet)** Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%.
1195	285			
1200	280			

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
			1204	**GRANODIORITE (1190-1220 feet)** Continued	
1205	275				
1210	270				
1215	265				
1220	260		1220		**Total Borehole Depth:** Driller = 1220 feet; Geophysical Logging = 1183 feet

APPENDIX C

Chemical Characteristics of Formation Water

May 23, 2018

Barbara Sylvester
Brown & Caldwell
201 E. Washington Suite 500
Phoenix, AZ 85004

TEL (602) 567-3894
FAX -

Work Order No.: 18D0619
Order Name: Florence Copper

RE: PTF

Dear Barbara Sylvester,

Turner Laboratories, Inc. received 2 sample(s) on 04/25/2018 for the analyses presented in the following report.

All results are intended to be considered in their entirety, and Turner Laboratories, Inc. is not responsible for use of less than the complete report. Results apply only to the samples analyzed. Samples will be disposed of 30 days after issue of our report unless special arrangements are made.

The pages that follow may contain sensitive, privileged or confidential information intended solely for the addressee named above. If you receive this message and are not the agent or employee of the addressee, this communication has been sent in error. Please do not disseminate or copy any of the attached and notify the sender immediately by telephone. Please also return the attached sheet(s) to the sender by mail.

Please call if you have any questions.

Respectfully submitted,

Turner Laboratories, Inc.
ADHS License AZ0066

Kevin Brim
Project Manager

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

Order: Florence Copper

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date/Time
18D0619-01	R-09	Ground Water	04/23/2018 1555
18D0619-02	TB	Ground Water	04/25/2018 0000

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

Case Narrative

The 8015D analysis was performed by TestAmerica Laboratories, Inc. in Phoenix, AZ.

The radiochemistry analysis was performed by Radiation Safety Engineering, Inc. in Chandler, AZ.

D5	Minimum Reporting Limit (MRL) is adjusted due to sample dilution; analyte was non-detect in the sample.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated LCS/LCSD recovery was acceptable.

All soil, sludge, and solid matrix determinations are reported on a wet weight basis unless otherwise noted.

ND	Not Detected at or above the PQL
PQL	Practical Quantitation Limit
DF	Dilution Factor
PRL	Project Reporting Limit

Turner Laboratories, Inc.

Date: 05/23/2018

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-01

Client Sample ID: R-09
Collection Date/Time: 04/23/2018 1555
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
ICP Dissolved Metals-E 200.7 (4.4)									
Calcium	140		4.0	M3	mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Iron	ND		0.30		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Magnesium	27		3.0		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Potassium	6.8		5.0		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Sodium	170		5.0	M3	mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
ICP/MS Dissolved Metals-E 200.8 (5.4)									
Aluminum	ND		0.0800	D5	mg/L	2	04/27/2018 1440	05/07/2018 1139	MH
Antimony	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Arsenic	0.0016		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Barium	0.071		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Beryllium	ND		0.00050	D5	mg/L	2	04/27/2018 1440	05/07/2018 1139	MH
Cadmium	ND		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Chromium	0.0051		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Cobalt	ND		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Copper	0.011		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Lead	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Manganese	0.0020		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Nickel	0.0033		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Selenium	ND		0.0025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Thallium	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Zinc	ND		0.040		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
CVAA Dissolved Mercury-E 245.1									
Mercury	ND		0.0010		mg/L	1	04/26/2018 0955	04/26/2018 1639	MH
pH-E150.1									
pH (pH Units)	7.8			H5	-	1	04/26/2018 1615	04/26/2018 1616	AP
Temperature (°C)	22			H5	-	1	04/26/2018 1615	04/26/2018 1616	AP
ICP/MS Total Metals-E200.8 (5.4)									
Uranium	0.016		0.00050		mg/L	1	04/27/2018 1230	04/30/2018 1348	MH

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-01

Client Sample ID: R-09
Collection Date/Time: 04/23/2018 1555
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Anions by Ion Chromatography-E300.0 (2.1)									
Chloride	310		25		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Fluoride	ND		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrate (As N)	8.8		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrite (As N)	ND		0.10		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Sulfate	190		130		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Cyanide-E335.4									
Cyanide	ND		0.10		mg/L	1	04/26/2018 0845	04/30/2018 1545	AP
Alkalinity-SM2320B									
Alkalinity, Bicarbonate (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Carbonate (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Hydroxide (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Phenolphthalein (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Total (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Specific Conductance-SM2510 B									
Conductivity	1700		0.20		µmhos/cm	2	05/09/2018 1315	05/09/2018 1330	AP
Total Dissolved Solids (Residue, Filterable)-SM2540 C									
Total Dissolved Solids (Residue, Filterable)	1000		20		mg/L	1	04/26/2018 0826	05/01/2018 1600	EJ
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Surr: 4-Bromofluorobenzene	*95*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 1943*	*KP*
Surr: Dibromofluoromethane	*101*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 1943*	*KP*
Surr: Toluene-d8	*77*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 1943*	*KP*

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-02

Client Sample ID: TB
Collection Date/Time: 04/25/2018 0000
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Surr: 4-Bromofluorobenzene	*101*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 2344*	*KP*
Surr: Dibromofluoromethane	*110*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 2344*	*KP*
Surr: Toluene-d8	*103*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 2344*	*KP*

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804269 - E 245.1										
Blank (1804269-BLK1)				Prepared & Analyzed: 04/26/2018						
Mercury	ND	0.0010	mg/L							
LCS (1804269-BS1)				Prepared & Analyzed: 04/26/2018						
Mercury	0.0049	0.0010	mg/L	0.005000		98	85-115			
LCS Dup (1804269-BSD1)				Prepared & Analyzed: 04/26/2018						
Mercury	0.0048	0.0010	mg/L	0.005000		95	85-115	2	20	
Matrix Spike (1804269-MS1)		**Source: 18D0394-01**		Prepared & Analyzed: 04/26/2018						
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	97	85-115			
Matrix Spike Dup (1804269-MSD1)		**Source: 18D0394-01**		Prepared & Analyzed: 04/26/2018						
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	96	85-115	1	20	
Batch 1804292 - E200.8 (5.4)										
Blank (1804292-BLK1)				Prepared & Analyzed: 04/30/2018						
Uranium	ND	0.00050	mg/L							
LCS (1804292-BS1)				Prepared & Analyzed: 04/30/2018						
Uranium	0.046	0.00050	mg/L	0.05000		92	85-115			
LCS Dup (1804292-BSD1)				Prepared & Analyzed: 04/30/2018						
Uranium	0.046	0.00050	mg/L	0.05000		92	85-115	0.2	20	
Matrix Spike (1804292-MS1)		**Source: 18D0614-01**		Prepared & Analyzed: 04/30/2018						
Uranium	0.051	0.00050	mg/L	0.05000	0.0015	99	70-130			
Batch 1805051 - E 200.7 (4.4)										
Blank (1805051-BLK1)				Prepared & Analyzed: 05/04/2018						
Calcium	ND	4.0	mg/L							
Iron	ND	0.30	mg/L							
Magnesium	ND	3.0	mg/L							
Potassium	ND	5.0	mg/L							
Sodium	ND	5.0	mg/L							
LCS (1805051-BS1)				Prepared & Analyzed: 05/04/2018						
Calcium	11	4.0	mg/L	10.00		109	85-115			
Iron	1.0	0.30	mg/L	1.000		104	85-115			
Magnesium	10	3.0	mg/L	10.00		105	85-115			
Potassium	10	5.0	mg/L	10.00		105	85-115			
Sodium	10	5.0	mg/L	10.00		105	85-115			
LCS Dup (1805051-BSD1)				Prepared & Analyzed: 05/04/2018						
Calcium	11	4.0	mg/L	10.00		110	85-115	1	20	
Iron	1.0	0.30	mg/L	1.000		105	85-115	0.5	20	
Magnesium	10	3.0	mg/L	10.00		105	85-115	0.06	20	
Potassium	10	5.0	mg/L	10.00		105	85-115	0.05	20	
Sodium	11	5.0	mg/L	10.00		109	85-115	4	20	

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805051 - E 200.7 (4.4)										
Matrix Spike (1805051-MS1)	**Source: 18D0619-01**			Prepared & Analyzed: 05/04/2018						
Calcium	150	4.0	mg/L	10.00	140	59	70-130			M3
Iron	1.1	0.30	mg/L	1.000	0.028	105	70-130			
Magnesium	38	3.0	mg/L	10.00	27	108	70-130			
Potassium	17	5.0	mg/L	10.00	6.8	105	70-130			
Sodium	170	5.0	mg/L	10.00	170	30	70-130			M3
Matrix Spike (1805051-MS2)	**Source: 18E0021-01**			Prepared & Analyzed: 05/04/2018						
Calcium	64	4.0	mg/L	10.00	54	103	70-130			
Iron	1.0	0.30	mg/L	1.000	0.0060	101	70-130			
Magnesium	21	3.0	mg/L	10.00	11	99	70-130			
Potassium	15	5.0	mg/L	10.00	4.7	104	70-130			
Sodium	99	5.0	mg/L	10.00	90	87	70-130			
Batch 1805069 - E 200.8 (5.4)										
Blank (1805069-BLK1)				Prepared & Analyzed: 05/07/2018						
Aluminum	ND	0.0400	mg/L							
Antimony	ND	0.00050	mg/L							
Arsenic	ND	0.00050	mg/L							
Barium	ND	0.00050	mg/L							
Beryllium	ND	0.00025	mg/L							
Cadmium	ND	0.00025	mg/L							
Chromium	ND	0.00050	mg/L							
Cobalt	ND	0.00025	mg/L							
Copper	ND	0.00050	mg/L							
Lead	ND	0.00050	mg/L							
Manganese	ND	0.00025	mg/L							
Nickel	ND	0.00050	mg/L							
Selenium	ND	0.0025	mg/L							
Thallium	ND	0.00050	mg/L							
Zinc	ND	0.040	mg/L							
LCS (1805069-BS1)				Prepared & Analyzed: 05/07/2018						
Aluminum	0.104	0.0400	mg/L	0.1000		104	85-115			
Antimony	0.048	0.00050	mg/L	0.05000		96	85-115			
Arsenic	0.050	0.00050	mg/L	0.05000		100	85-115			
Barium	0.050	0.00050	mg/L	0.05000		100	85-115			
Beryllium	0.049	0.00025	mg/L	0.05000		97	85-115			
Cadmium	0.050	0.00025	mg/L	0.05000		100	85-115			
Chromium	0.051	0.00050	mg/L	0.05000		102	85-115			
Cobalt	0.051	0.00025	mg/L	0.05000		101	85-115			
Copper	0.051	0.00050	mg/L	0.05000		103	85-115			
Lead	0.049	0.00050	mg/L	0.05000		98	85-115			
Manganese	0.050	0.00025	mg/L	0.05000		101	85-115			
Nickel	0.051	0.00050	mg/L	0.05000		102	85-115			
Selenium	0.051	0.0025	mg/L	0.05000		103	85-115			
Thallium	0.050	0.00050	mg/L	0.05000		101	85-115			
Zinc	0.10	0.040	mg/L	0.1000		101	85-115			

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805069 - E 200.8 (5.4)										
LCS Dup (1805069-BSD1)				Prepared & Analyzed: 05/07/2018						
Aluminum	0.115	0.0400	mg/L	0.1000		115	85-115	10	20	
Antimony	0.048	0.00050	mg/L	0.05000		96	85-115	0.7	20	
Arsenic	0.050	0.00050	mg/L	0.05000		101	85-115	0.8	20	
Barium	0.051	0.00050	mg/L	0.05000		102	85-115	1	20	
Beryllium	0.049	0.00025	mg/L	0.05000		97	85-115	0.2	20	
Cadmium	0.050	0.00025	mg/L	0.05000		100	85-115	0.2	20	
Chromium	0.051	0.00050	mg/L	0.05000		102	85-115	0.4	20	
Cobalt	0.050	0.00025	mg/L	0.05000		101	85-115	0.5	20	
Copper	0.052	0.00050	mg/L	0.05000		105	85-115	2	20	
Lead	0.049	0.00050	mg/L	0.05000		98	85-115	0.1	20	
Manganese	0.050	0.00025	mg/L	0.05000		101	85-115	0.09	20	
Nickel	0.051	0.00050	mg/L	0.05000		103	85-115	0.8	20	
Selenium	0.052	0.0025	mg/L	0.05000		104	85-115	2	20	
Thallium	0.050	0.00050	mg/L	0.05000		101	85-115	0.06	20	
Zinc	0.10	0.040	mg/L	0.1000		104	85-115	3	20	
Matrix Spike (1805069-MS1)		**Source: 18D0693-01**		Prepared & Analyzed: 05/07/2018						
Aluminum	0.239	0.0400	mg/L	0.1000	0.166	74	70-130			
Antimony	0.045	0.00050	mg/L	0.05000	0.00024	90	70-130			
Arsenic	0.056	0.00050	mg/L	0.05000	0.0035	104	70-130			
Barium	0.16	0.00050	mg/L	0.05000	0.12	94	70-130			
Beryllium	0.045	0.00025	mg/L	0.05000	0.000029	90	70-130			
Cadmium	0.047	0.00025	mg/L	0.05000	ND	94	70-130			
Chromium	0.049	0.00050	mg/L	0.05000	0.00052	98	70-130			
Cobalt	0.048	0.00025	mg/L	0.05000	0.00097	95	70-130			
Copper	0.051	0.00050	mg/L	0.05000	0.0020	98	70-130			
Lead	0.047	0.00050	mg/L	0.05000	0.00016	94	70-130			
Manganese	0.054	0.00025	mg/L	0.05000	0.0075	94	70-130			
Nickel	0.049	0.00050	mg/L	0.05000	0.0018	94	70-130			
Selenium	0.057	0.0025	mg/L	0.05000	ND	114	70-130			
Thallium	0.048	0.00050	mg/L	0.05000	0.000038	96	70-130			
Zinc	0.11	0.040	mg/L	0.1000	ND	109	70-130			

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804261 - SM2540 C										
Duplicate (1804261-DUP1)		**Source: 18D0606-01**		Prepared: 04/26/2018 Analyzed: 04/27/2018						
Total Dissolved Solids (Residue, Filterable)	630	20	mg/L		630			0.3	5	
Duplicate (1804261-DUP2)		**Source: 18D0606-02**		Prepared: 04/26/2018 Analyzed: 04/27/2018						
Total Dissolved Solids (Residue, Filterable)	610	20	mg/L		620			0.8	5	
Batch 1804268 - E335.4										
Blank (1804268-BLK1)				Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	ND	0.10	mg/L							
LCS (1804268-BS1)				Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.0	0.10	mg/L	2.000		101	90-110			
LCS Dup (1804268-BSD1)				Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.0	0.10	mg/L	2.000		101	90-110	0.1	20	
Matrix Spike (1804268-MS1)		**Source: 18D0602-03**		Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.1	0.10	mg/L	2.000	ND	103	90-110			
Matrix Spike Dup (1804268-MSD1)		**Source: 18D0602-03**		Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.0	0.10	mg/L	2.000	ND	98	90-110	5	20	
Batch 1804272 - E150.1										
Duplicate (1804272-DUP1)		**Source: 18D0662-02**		Prepared & Analyzed: 04/26/2018						
pH (pH Units)	7.8		-		7.8			0.1	200	H5
Temperature (°C)	21		-		21			2	200	H5
Batch 1805027 - SM2320B										
LCS (1805027-BS1)				Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	240	2.0	mg/L	250.0		96	90-110			
LCS Dup (1805027-BSD1)				Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	240	2.0	mg/L	250.0		96	90-110	0	10	
Matrix Spike (1805027-MS1)		**Source: 18D0606-02**		Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	370	2.0	mg/L	250.0	130	96	85-115			
Matrix Spike Dup (1805027-MSD1)		**Source: 18D0606-02**		Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	370	2.0	mg/L	250.0	130	95	85-115	0.5	10	
Batch 1805103 - SM2510 B										
LCS (1805103-BS1)				Prepared & Analyzed: 05/09/2018						
Conductivity	140	0.10	µmhos/cm	141.2		101	0-200			
LCS Dup (1805103-BSD1)				Prepared & Analyzed: 05/09/2018						
Conductivity	140	0.10	µmhos/cm	141.2		101	0-200	0.7	200	
Duplicate (1805103-DUP1)		**Source: 18E0192-01**		Prepared & Analyzed: 05/09/2018						
Conductivity	4.0	0.10	µmhos/cm		4.0			0	10	

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805074 - SW8260B										
Blank (1805074-BLK1)				Prepared & Analyzed: 05/07/2018						
Benzene	ND	0.50	ug/L							
Carbon disulfide	ND	2.0	ug/L							
Ethylbenzene	ND	0.50	ug/L							
Toluene	ND	0.50	ug/L							
Xylenes, Total	ND	1.5	ug/L							
Surrogate: 4-Bromofluorobenzene	*25.0*		*ug/L*	*25.00*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*26.9*		*ug/L*	*25.00*		*107*	*70-130*			
Surrogate: Toluene-d8	*25.1*		*ug/L*	*25.00*		*100*	*70-130*			
LCS (1805074-BS1)				Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	29		ug/L	25.00		114	70-130			
Benzene	27		ug/L	25.00		109	70-130			
Chlorobenzene	29		ug/L	25.00		115	70-130			
Toluene	25		ug/L	25.00		101	70-130			
Trichloroethene	26		ug/L	25.00		103	70-130			
Surrogate: 4-Bromofluorobenzene	*24.6*		*ug/L*	*25.00*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*25.6*		*ug/L*	*25.00*		*102*	*70-130*			
Surrogate: Toluene-d8	*24.8*		*ug/L*	*25.00*		*99*	*70-130*			
LCS Dup (1805074-BSD1)				Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	27		ug/L	25.00		110	70-130	4	30	
Benzene	26		ug/L	25.00		104	70-130	5	30	
Chlorobenzene	26		ug/L	25.00		105	70-130	9	30	
Toluene	24		ug/L	25.00		96	70-130	5	30	
Trichloroethene	25		ug/L	25.00		98	70-130	4	30	
Surrogate: 4-Bromofluorobenzene	*24.4*		*ug/L*	*25.00*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*26.1*		*ug/L*	*25.00*		*104*	*70-130*			
Surrogate: Toluene-d8	*25.1*		*ug/L*	*25.00*		*100*	*70-130*			
Matrix Spike (1805074-MS1)	**Source: 18D0582-02**			Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	27		ug/L	25.00	0.070	109	70-130			
Benzene	26		ug/L	25.00	0.020	104	70-130			
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130			
Toluene	27		ug/L	25.00	3.5	95	70-130			
Trichloroethene	24		ug/L	25.00	0.040	97	70-130			
Surrogate: 4-Bromofluorobenzene	*24.4*		*ug/L*	*25.00*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*26.4*		*ug/L*	*25.00*		*106*	*70-130*			
Surrogate: Toluene-d8	*24.9*		*ug/L*	*25.00*		*100*	*70-130*			
Matrix Spike Dup (1805074-MSD1)	**Source: 18D0582-02**			Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	27		ug/L	25.00	0.070	108	70-130	0.8	30	
Benzene	25		ug/L	25.00	0.020	101	70-130	2	30	
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130	0.3	30	
Toluene	27		ug/L	25.00	3.5	95	70-130	0.1	30	
Trichloroethene	24		ug/L	25.00	0.040	95	70-130	2	30	
Surrogate: 4-Bromofluorobenzene	*24.7*		*ug/L*	*25.00*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*26.4*		*ug/L*	*25.00*		*106*	*70-130*			
Surrogate: Toluene-d8	*25.3*		*ug/L*	*25.00*		*101*	*70-130*			

Client: Brown & Caldwell
Project: PTF
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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804245 - E300.0 (2.1)										
Blank (1804245-BLK1)				Prepared & Analyzed: 04/25/2018						
Chloride	ND	1.0	mg/L							
Fluoride	ND	0.50	mg/L							
Nitrogen, Nitrate (As N)	ND	0.50	mg/L							
Nitrogen, Nitrite (As N)	ND	0.10	mg/L							
Sulfate	ND	5.0	mg/L							
LCS (1804245-BS1)				Prepared & Analyzed: 04/25/2018						
Chloride	12	1.0	mg/L	12.50		92	90-110			
Fluoride	2.0	0.50	mg/L	2.000		101	90-110			
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000		95	90-110			
Nitrogen, Nitrite (As N)	2.3	0.10	mg/L	2.500		92	90-110			
Sulfate	12	5.0	mg/L	12.50		96	90-110			
LCS Dup (1804245-BSD1)				Prepared & Analyzed: 04/25/2018						
Chloride	12	1.0	mg/L	12.50		94	90-110	2	10	
Fluoride	2.0	0.50	mg/L	2.000		101	90-110	0.4	10	
Nitrogen, Nitrate (As N)	4.9	0.50	mg/L	5.000		98	90-110	3	10	
Nitrogen, Nitrite (As N)	2.4	0.10	mg/L	2.500		95	90-110	3	10	
Sulfate	12	5.0	mg/L	12.50		98	90-110	3	10	
Matrix Spike (1804245-MS1)		**Source: 18D0613-08**		Prepared & Analyzed: 04/25/2018						
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120			
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	89	80-120			
Matrix Spike (1804245-MS2)		**Source: 18D0625-01**		Prepared & Analyzed: 04/26/2018						
Nitrogen, Nitrate (As N)	5.0	0.50	mg/L	5.000	0.46	92	80-120			
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120			
Matrix Spike (1804245-MS3)		**Source: 18D0614-01RE1**		Prepared & Analyzed: 04/26/2018						
Chloride	17		mg/L	12.50	6.4	88	80-120			
Sulfate	28		mg/L	12.50	18	85	80-120			
Matrix Spike Dup (1804245-MSD1)		**Source: 18D0613-08**		Prepared & Analyzed: 04/25/2018						
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120	0.4	10	
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	90	80-120	0.6	10	
Matrix Spike Dup (1804245-MSD2)		**Source: 18D0625-01**		Prepared & Analyzed: 04/26/2018						
Nitrogen, Nitrate (As N)	5.1	0.50	mg/L	5.000	0.46	92	80-120	0.2	10	
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120	0.4	10	
Matrix Spike Dup (1804245-MSD3)		**Source: 18D0614-01RE1**		Prepared & Analyzed: 04/26/2018						
Chloride	18		mg/L	12.50	6.4	89	80-120	0.6	10	
Sulfate	29		mg/L	12.50	18	86	80-120	0.6	10	

TURNER LABORATORIES INC.
2445 N. Coyote Drive, Suite 104
Tucson, Arizona 85745
(520) 882-5880
Fax: (520) 882-9788
www.turnerlabs.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

TURNER WORK ORDER # 18D0619 DATE 4/23/18 PAGE 1 OF 1

PROJECT NAME Florence Copper #

CONTACT NAME: Barb Sylvester

COMPANY NAME: Brown and Caldwell

ADDRESS: 2 N Central Ave, Suite 1600

CITY Phoenix STATE AZ ZIP CODE 85004

PHONE 602-567-3894 FAX

SAMPLER'S SIGNATURE [signature]

CIRCLE ANALYSIS REQUESTED AND/OR CHECK THE APPROPRIATE BOX

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX*	NUMBER OF CONTAINERS	Diss Metals - list (Field Filtered)	Total Uranium (not Filtered)	Inorganics - list	Cyanide (free)	Organics - list	G.Alpha, (RadSafety sub)	Uranium activity if G. Alpha >12	Ra226, 228, Ra-Tot (RadsSafety)	TPH-D (TestAmerica Sub)
R-09	4-23-18	1555		GW	10	X	X	X	X	X	X	X	X	X
8260 TB	4-23-18	1606		GW	1					X				
				GW										
				GW										
				GW										
				GW										
				GW										
				GW										
				GW										
				GW										
				GW										

1. RELINQUISHED BY:
Signature [signature]
Printed Name [illegible]
Firm [illegible]
Date/Time 4-23-18 1630

2. RECEIVED BY:
Signature UPS
Printed Name
Firm
Date/Time

3. RELINQUISHED BY:
Signature UPS
Printed Name
Firm
Date/Time

4. RECEIVED BY:
Signature [signature]
Printed Name Joseph Catalano
Firm TURNER LABORATORIES INC.
Date/Time 4/23/18 1006

TURNAROUND REQUIREMENTS:
X Standard (approx10 days)*
___ Next day ___ 2 Day ___ 5 Day*
___ Email Preliminary Results To:
* Working Days

REPORT REQUIREMENTS:
X I. Routine Report
___ II. Report (includes DUP,MS,MSD, as required, may be charged as samples)
___ III. Date Validation Report (Includes All Raw Data)
Add 10% to invoice

INVOICE INFORMATION:
Account X Y ___ N
P.O. #
Bill to: Florence Copper

SAMPLE RECEIPT:
Total Containers
Temperature 2.2
☑ Wet Ice ☐ Blue Ice

*LEGEND
DW = DRINKING WATER
GW = GROUNDWATER
SD = SOLID
SG = SLUDGE
SL = SOIL
ST = STORMWATER
WW = WASTEWATER

SPECIAL INSTRUCTIONS/COMMENTS:

Compliance Analysis: ☐ Yes ☐ No	Custody Seals ☐	Preservation Confirmation ☒
ADEQ Forms: ☐ Yes ☐ No	Container Intact ☒	Appropriate Head Space ☒
Mail ADEQ Forms: ☐ Yes ☐ No	COC/Labels Agree ☒	Received Within Hold Time ☒

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

TestAmerica Job ID: 550-101943-1
Client Project/Site: 18D0619

For:
Turner Laboratories, Inc.
2445 North Coyote Drive
Suite 104
Tucson, Arizona 85745

Attn: Kevin Brim

Authorized for release by:
5/16/2018 12:23:25 PM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Definitions/Glossary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
Q9	Insufficient sample received to meet method QC requirements.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Job ID: 550-101943-1

Laboratory: TestAmerica Phoenix

Narrative

Job Narrative
550-101943-1

Comments
No additional comments.

Receipt
The sample was received on 4/27/2018 10:50 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.8º C.

GC Semi VOA
Method(s) 8015D: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD) associated with preparation batch 550-145985 and analytical batch 550-146884. Affected samples have been added a Q9 qualifier. 18D0619-01 (550-101943-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method(s) 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 3510C.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-101943-1	18D0619-01	Water	04/23/18 15:55	04/27/18 10:50

Detection Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01

Lab Sample ID: 550-101943-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
ORO (C22-C32)	0.21	Q9	0.20		mg/L	1		8015D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01
Date Collected: 04/23/18 15:55
Date Received: 04/27/18 10:50

Lab Sample ID: 550-101943-1
Matrix: Water

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
ORO (C22-C32)	0.21	Q9	0.20		mg/L		04/30/18 14:16	05/10/18 23:29	1
DRO (C10-C22)	ND	Q9	0.10		mg/L		04/30/18 14:16	05/10/18 23:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*79*		*10 - 150*	*04/30/18 14:16*	*05/10/18 23:29*	*1*

Surrogate Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method: 8015D - Diesel Range Organics (DRO) (GC)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	OTPH (10-150)							
550-101943-1	18D0619-01	79							
LCS 550-145985/2-A	Lab Control Sample	79							
LCSD 550-145985/3-A	Lab Control Sample Dup	79							
MB 550-145985/1-A	Method Blank	65							

Surrogate Legend

OTPH = o-Terphenyl (Surr)

Method: 8015D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 550-145985/1-A
Matrix: Water
Analysis Batch: 146884

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 145985

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
ORO (C22-C32)	ND		0.20		mg/L		04/30/18 14:15	05/11/18 11:16	1
DRO (C10-C22)	ND		0.10		mg/L		04/30/18 14:15	05/11/18 11:16	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*65*		*10 - 150*	*04/30/18 14:15*	*05/11/18 11:16*	*1*

Lab Sample ID: LCS 550-145985/2-A
Matrix: Water
Analysis Batch: 146884

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 145985

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
ORO (C22-C32)			1.60	1.59		mg/L		99	69 - 107		
DRO (C10-C22)			0.400	0.450		mg/L		113	42 - 133		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl (Surr)	*79*		*10 - 150*

Lab Sample ID: LCSD 550-145985/3-A
Matrix: Water
Analysis Batch: 146884

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 145985

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
ORO (C22-C32)			1.60	1.59		mg/L		100	69 - 107	0	20
DRO (C10-C22)			0.400	0.447		mg/L		112	42 - 133	1	22

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl (Surr)	*79*		*10 - 150*

QC Association Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

GC Semi VOA

Prep Batch: 145985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	3510C	
MB 550-145985/1-A	Method Blank	Total/NA	Water	3510C	
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 146884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	8015D	145985
MB 550-145985/1-A	Method Blank	Total/NA	Water	8015D	145985
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	8015D	145985
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	8015D	145985

Lab Chronicle

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01
Date Collected: 04/23/18 15:55
Date Received: 04/27/18 10:50

Lab Sample ID: 550-101943-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			145985	04/30/18 14:16	REM	TAL PHX
Total/NA	Analysis	8015D		1	146884	05/10/18 23:29	TC1	TAL PHX

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Laboratory: TestAmerica Phoenix

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-18

Analysis Method	Prep Method	Matrix	Analyte

Method Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method	Method Description	Protocol	Laboratory
8015D	Diesel Range Organics (DRO) (GC)	SW846	TAL PHX
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL PHX

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

SUBCONTRACT ORDER

Turner Laboratories, Inc.

101943

18D0619

SENDING LABORATORY:	RECEIVING LABORATORY:
Turner Laboratories, Inc.	TestAmerica Phoenix
2445 N. Coyote Drive, Ste #104	4625 East Cotton Center Boulevard Suite 189
Tucson, AZ 85745	Phoenix, AZ 85540
Phone: 520.882.5880	Phone :(602) 437-3340
Fax: 520.882.9788	Fax:
Project Manager: Kevin Brim	Please CC Kevin Brim Kbrim@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
-01			
Sample ID: 18D0619-01 Drinking Water	**Sampled:04/23/2018 15:55**		
8015D Sub	04/30/2018 15:55		8015D DRO and ORO Paramaters Only
Containers Supplied:			

8015D Sub
o-Terphenyl
C10-C32 (Total)
C22-C32 (Oil Range Organics)
C10-C22 (Diesel Range Organics)
C6-C10 (Gasoline Range Organics)

550-101943 Chain of Custody

3,8°C UPS GR

TA-PHX

Released By	Date	Received By	Date
	4/24/18		4-27-18 1050
Released By	Date	Received By	Date

Login Sample Receipt Checklist

Client: Turner Laboratories, Inc.

Job Number: 550-101943-1

Login Number: 101943
List Number: 1
Creator: Gravlin, Andrea

List Source: TestAmerica Phoenix

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	False	Check done at department level as required.

Radiation Safety Engineering, Inc.
3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121 (480) 897-9459
Website: www.radsafe.com FAX (480) 892-5446

Radiochemical Activity in Water (pCi/L)

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: April 23, 2018
Sample Received: May 01, 2018
Analysis Completed: May 22, 2018

Sample ID	Gross Alpha Activity Method 600/00-02 (pCi/L)	Uranium Activity Method ASTM D6239 (pCi/L)	Adjusted Gross Alpha (pCi/L)	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
18D0619-01	17.7 ± 0.9	12.9 ± 1.2	4.8 ± 1.5	3.1 ± 0.3	3.1 ± 0.4	6.2 ± 0.5
Date of Analysis	5/2/2018	5/21/2018	5/21/2018	5/4/2018	5/4/2018	5/4/2018

Robert L. Metzger, Ph.D., C.H.P. 5/22/2018
Laboratory License Number AZ0462 Date

Radiation Safety Engineering, Inc.
3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121 (480) 897-9459
Website: www.radsafe.com FAX (480) 892-5446

Isotopic Uranium Analysis

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: April 23, 2018
Sample Received: May 01, 2018
Uranium Analysis Date: May 21, 2018

Sample No.	^{238}U	^{235}U	^{234}U	Total	
18D0619-01	6.0 ± 0.6	0.280 ± 0.004	6.6 ± 0.6	12.9 ± 1.2	Activity (pCi/L)
	17.9 ± 1.7	0.131 ± 0.002	0.00106 ± 0.00010	18.0 ± 1.7	Content (µg/L)
	Comments:				

Robert L. Metzger, Ph.D., C.H.P. 5/22/2018
Date

Laboratory License Number AZ0462

Arizona Department of Environmental Quality

Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report

Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04 _____ PWS Name: _____

April 23, 2018 (Sample Date) 15:55 (Sample Time) (24 hour clock) _____ (Owner/Contact Person)

_____ (Owner/Contact Fax Number) _____ (Owner/Contact Phone Number)

Sample Collection Point

☐ EPDS # _____

Compliance Sample Type:

☐ Reduced Monitoring — Date Q1 collected: _____

☐ Quarterly — Date Q2 collected: _____

☐ Composite of four quarterly samples — Date Q3 collected: _____

Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result		Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000	5/21/2018	4.8 ± 1.5		
600/00-02		3 pCi/L	Gross Alpha	4002	5/2/2018	17.7 ± 0.9		
7500 - Rn			Radon	4004				
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006	5/21/2018	18.0 ± 1.7	µg/L	
			Uranium 234	4007	5/21/2018	0.00106 ± 0.00010		
			Uranium 235	4008	5/21/2018	0.131 ± 0.002		
			Uranium 238	4009	5/21/2018	17.9 ± 1.7		
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	5/4/2018	6.2 ± 0.5		X
GammaRay HPGE		1 pCi/L	Radium 226	4020	5/4/2018	3.1 ± 0.3		
GammaRay HPGE		1 pCi/L	Radium 228	4030	5/4/2018	3.1 ± 0.4		

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

Specimen Number: RSE60312

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 18D0619-01

Authorized Signature: Robt L. Metzger

Date Public Water System Notified: _____

DWAR 6: 11/2007

SUBCONTRACT ORDER

Turner Laboratories, Inc.

18D0619

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Kevin Brim

RECEIVING LABORATORY:

Radiation Safety Engineering, Inc.
3245 N. Washington St.
Chandler, AZ 85225-1121
Phone :(480) 897-9459
Fax: (480) 892-5446
Please CC Kevin Brim Kbrim@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 18D0619-01 Drinking Water Sampled:04/23/2018 15:55			
Radiochemistry, Gross Alpha	10/20/2018 15:55		Analyze Uranium and Adjusted Alpha if G. Alpha is > 12
Radiochemistry, Radium 226/228	05/23/2018 15:55		
Containers Supplied:			

H 60312

Released By	Date	Received By	Date
[signature]	4/30/18 16:00	UPS	4/30/18 16:00
Released By	Date	Received By	Date

APPENDIX D

Well Completion Documentation

PIPE TALLY

Project Name.: FCI PTF well field	Project No.: 129687-007
Well No.: I-01	Date: 12-3-17 to 12-4-17
Location: Florence AZ	Pipe Talley for: Overburden 14"
Total Depth: 506'	Geologist: C. Price

Type of Connections: ☒ Welded ☐ T+C ☐ Flush Thread ☐ Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Dist. from sensor bottom to bottom of pipe (feet)	Sensor Type (ACD, CS, ERT)	Sensor ID	Wire Lead ID	Depth of Sensor (feet bgs)
1	2.14	2.14	2.14	grout shoe					
2	✓	40.29	42.43	LCS w/polyethylene					
3	✓	40.31	82.74	LCS,					
4	✓	40.29	123.03	↓					
5	✓	40.30	163.33						
6	✓	40.01	203.34						
7	✓	40.03	243.37						
8	✓	40.04	283.41						
9	✓	40.04	323.45						
10	✓	40.03	363.48						
11	✓	40.04	403.52						
12	✓	40.02	443.54						
13	✓	40.02	483.56						
14	✓	12.35	495.91						
15	✓	13.79	509.70	↓					

Notes:
Pipe 2-5 - LCS - Low Carbon Steel, Single seam, vertical.
Pipe 6-15 LCS, spiral seam, single 14" O.D. 0.312 wall thickness
Grout shoe -

SUMMARY OF TALLY

Total Length tallied:	509.70'
Casing Stick-Up:	2.2
Length of Casing Cut-Off:	5.36'
Bottom of Well:	500'
Screened Interval:	—
Total Screen in Hole:	—

Sensor Types: Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing
Conductivity Sensor (CS) 4 sensors with sing lead 20 ft spacing
Electrical Resistivity Tomography (ERT)

Centralizers every 40', starting ~~for~~ ~~bottom~~ of pipe #3 ~~6604~~ half way up (446 ft BGS);
Centralizer placed at joint ~~of~~ bottom of Pipe 5, 20 ft above previous centralizer.

Landing Target, 7.56' stickup ags.
3.26' above surface casing
1.96' above deck

Surface casing @ install = 4.3' stickup
Deck @ install = 5.6' ags

HALEY ALDRICH

ESTIMATED ANNULAR MATERIAL RECORD

Project Name: FCI PTF Well **Project #.:** 129687-007 **Date:** 12/4/17
Well No.: I-07 **Geologist:** E. Smith / S. Hassel

ANNULAR VOLUME CALCULATIONS

Total Depth of Borehole [T]: 506 feet
Borehole Diameter [D]: 20 inches
Screen Length [L_s]: — feet
Screen Diameter [d_s]: — inches
Casing Length [L_c]: 500 feet
Casing Diameter [d_c]: 14 inches

Total Cased Depth: 500 feet
Rat Hole Volume [$R=(D^2)\ 0.005454*L_r$]: 12.93 Ft³
Rat Hole Length [L_r]: 6 feet
Camera Tube Length [L_{ct}]: ____ feet
Camera Tube Diameter [d_{ct}]: ____ inches

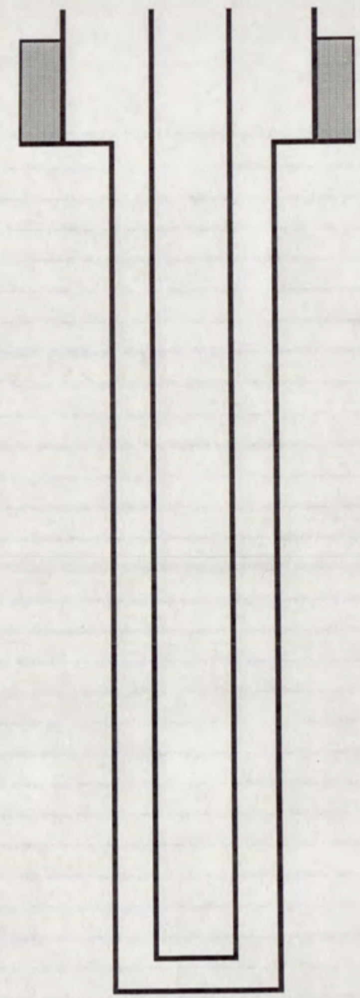
Screen Annular Volume (A_s): $(D^2-d_s^2)\ 0.005454$ = — Ft³/Lin. Ft
Casing Annular Volume (A_c): $(D^2-d_c^2)\ 0.005454$ = 1.11 Ft³/Lin. Ft
Casing/Cam.Tube Annular Volume (A_{c+ct}): $(D^2-d_c^2-d_{ct}^2)\ 0.005454$ = — Ft³/Lin. Ft

EQUATIONS

2,700 lbs. Silica Sand = 1 cubic yard = 27 cubic feet
[1] Volume of bag (Ft³) = bag weight/100
[2] Calculated depth = Previous Calculated depth - (v/A)

Bentonite Sack = 0.69 ft³
Silica Sand Super Sack = 3000 lbs.

No.	✓	Weight of Bag (lbs.)	Volume of Bag[1] (v) (ft³)	Total Vol. of Bags (ft³)	Calculated Depth[2] (ft bls)	Tagged Depth (ft bls)	Comments
1		≈ 14.6 lb/gal	853.9	853.9	~100	Surface	Type V cement overdrilled weight 14.6 lb/gal (+21% of calc)



HALEY ALDRICH

PIPE TALLY

Project Name.: FC1	Project No.: 129087-007
Well No.: I-01	Date: 3-12-18
Location:	Pipe Talley for: WELL INSTAL
Total Depth: 1235	Geologist: C-GUST

Type of Connections: ☐ Welded ☐ T+C ☐ Flush Thread ☐ Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Dist. from sensor bottom to bottom of pipe (feet)	Sensor Type (ACD, CS, ERT)	Sensor ID	Wire Lead ID	Depth of Sensor (feet bgs)
1	✓	0.36	0.36	SS END CAP					
2	✓	19.99	20.35	0.080 PVC	SCREEN				
3	✓	19.99	40.34						
4	✓	19.99	60.33						
5	✓	19.99	80.32						
6	✓	19.99	100.31						
7	✓	19.99	120.30						
8	✓	19.99	140.29						
9	✓	19.99	160.28						
10	✓	19.99	180.27						
11	✓	19.99	200.26						
12	✓	19.98	220.24						
13	✓	19.99	240.23						
14	✓	20.00	260.23						
15	✓	19.99	280.22						
16	✓	20.03	300.25						
17	✓	10.00	310.25	SS BLANK					
18	✓	9.76	320.01						
19	✓	20.03	340.04	0.080 SCREEN PVC					
20	✓	20.03	360.07						
21	✓	20.03	380.10						
22	✓	20.04	400.14						
23	✓	20.04	420.18						
24	✓	20.03	440.21						
25	✓	20.04	460.25						
26	✓	20.03	480.28						
27	✓	20.03	500.31						
28	✓	20.03	520.34						
29	✓	20.02	540.36						
30	✓	9.85	550.21	SS BLAND					

Notes:

1 - 316 Stainless STEEL END CAP

Screen: Sch 80 0.080 SLOT PVC
5.56" OD 4.47" ID

BLANK: 316 Stainless steels sch 40
with modified threads to sch 80
5.56" OD 5.04" ID

ERP: 5.54 OD" 5.74 ID", 6.59" COUPLER

4 316 Stainless steel centralizers @ 40ft spacing

SUMMARY OF TALLY

Total Length tallied:	1211.71
Casing Stick-Up:	0.97
Length of Casing Cut-Off:	9.25
Bottom of Well:	1201.49
Screened Interval:	
Total Screen in Hole:	640

Sensor Types: ~~Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing~~
~~Conductivity Sensor (CS) 4 sensors with sing lead 20 ft spacing~~
~~Electrical Resistivity Tomography (ERT)~~

HALEY ALDRICH

HALEY ALDRICH

PIPE TALLY

Project Name.:	FC1	Project No.:	129687-007
Well No.:	I-03	Date:	3-12-18
Location:		Pipe Talley for:	WELL INSTAL
Total Depth:	1255	Geologist:	C.GROSS

Type of Connections: ☐ Welded ☐ T+C ☐ Flush Thread ☐ Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Dist. from sensor bottom to bottom of pipe (feet)	Sensor Type (ACD, CS, ERT)	Sensor ID	Wire Lead ID	Depth of Sensor (feet bgs)
31	✓	9.79	559.99	SS BLANK					
32	✓	20.02	580.01	0.080 PVC	SCREEN				
33	✓	20.03	600.04						
34	✓	20.01	620.05						
35	✓	20.02	640.07						
36	✓	20.03	660.10						
37	✓	20.02	680.12	↓					
38	✓	0.50	680.62	SS PVC/FRP					
39	✓	28.97	709.59	FRP					
40	✓	29.05	738.64						
41	✓	28.98	767.62						
42	✓	29.09	796.71						
43	✓	29.05	825.76						
44	✓	29.05	854.81						
45	✓	28.98	883.79						
46	✓	29.05	912.84						
47	✓	28.93	941.77						
48	✓	29.05	970.82						
49	✓	29.06	999.88						
50	✓	29.05	1028.93						
51	✓	29.06	1057.99						
52	✓	29.04	1087.03						
53	✓	28.91	1115.94						
54	✓	28.90	1144.84						
55	✓	28.75	1173.59						
56	✓	28.87	1202.46	↓					
57	✓	9.25	1211.71	FRP TEMP					

Notes:
RIG LANDING ELEVATION +10.22'
FROM NORTH RIM

SUMMARY OF TALLY

Total Length tallied:	1211.71
Casing Stick-Up:	0.97
Length of Casing Cut-Off:	9.25
Bottom of Well:	1201.49
Screened Interval:	901.24 - 1201.49, 661.13 - 881.19, 521.37 - 641.50
Total Screen in Hole:	698'

Sensor Types: Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing
Conductivity Sensor (CS) 4 sensors with sing lead 20 ft spacing
Electrical Resistivity Tomography (ERT)

HALEY ALDRICH

HALEY ALDRICH

Casing Layout

Project Name.:	Florence Copper INC	**Project No.:**	129687-007
Well No.:	I-01	**Date:**	3.12.18
Location:	Florence AZ	**Layout for:**	Lower
Total Depth:	1201.49	**Geologist:**	C. Giusti

Pipe Length		Depth BGS
		781.31
20.04	23	801.35
20.04	22	821.39
20.03	21	841.42
20.03	20	861.45
20.03	19	881.48
9.76	18	891.24
10.00	17	901.24
20.03	16	921.27
19.99	15	941.26
20.00	14	961.26
19.99	13	981.25
19.98	12	1001.23
19.99	11	1021.22
19.99	10	1041.21
19.99	9	1061.20
19.99	8	1081.19
19.99	7	1101.18
19.99	6	1121.17
19.99	5	1141.16
19.99	4	1161.15
19.99	3	1181.14
19.99	2	1201.13
0.36	1	1201.49

Pipe Length		Depth BGS
		288.65
29.05	46	317.70
28.98	45	346.68
29.05	44	375.73
29.05	43	404.78
29.09	42	433.87
28.98	41	462.85
29.05	40	491.90
28.97	39	520.87
0.50	38	521.37
20.02	37	541.39
20.03	36	561.42
20.02	35	581.44
20.01	34	601.45
20.03	33	621.48
20.02	32	641.50
9.78	31	651.28
9.85	30	661.13
20.02	29	681.15
20.03	28	701.18
20.03	27	721.21
20.03	26	741.24
20.04	25	761.28
20.03	24	781.31

Pipe Length		Depth BGS
	69	
	68	
	67	
	66	
	65	
	64	
	63	
	62	
	61	0.00
	60	0.00
	59	0.00
	58	0.00
	57	-0.97
28.87	56	27.90
28.75	55	56.65
28.90	54	85.55
28.91	53	114.46
29.04	52	143.50
29.06	51	172.56
29.05	50	201.61
29.06	49	230.67
29.05	48	259.72
28.93	47	288.65

SENSOR DETAILS

Sensor Type	Sensor ID	Pipe #	Distance from Bottom of Sensor to Bottom of Pipe	Depth of Sensor (BGS)
				#REF!
				#REF!
				#REF!

Pipe Number	Type
1	SS End Cap
2 - 16	PVC SCH 80 Screen 0.080
17,18	PVC SCH 80 Blank
19-29	PVC SCH 80 Screen 0.080
30-31	PVC SCH 80 Blank
32-37	PVC SCH 80 Screen 0.080
38	PVC SCH 80/SCH 40 Blank
39-56	5" FRP

Notes:

HALEY ALDRICH

ESTIMATED ANNULAR MATERIAL RECORD

Project Name: EC1 PTF **Project #.:** 129687-007 **Date:** 3/13/18-
Well No.: I-01 **Geologist:** S. Kaney / C. Gilcrist

ANNULAR VOLUME CALCULATIONS

Total Depth of Borehole [T]:	~~1235~~ feet	Total Cased Depth:	1201.49 feet
Borehole Diameter [D]:	12.25 inches	Rat Hole Volume [R=(D²) 0.005454*L_r]:	~~33.5~~ Ft³
Screen Length [L_s]:	640 feet	Rat Hole Length [L_r]	33.5 feet
Screen Diameter [d_s]:	5.5 inches	Camera Tube Length [L_ct]	— feet
Casing Length [L_c]	561 feet	Camera Tube Diameter [d_ct]	— inches
Casing Diameter [d_c]	5.5 inches		

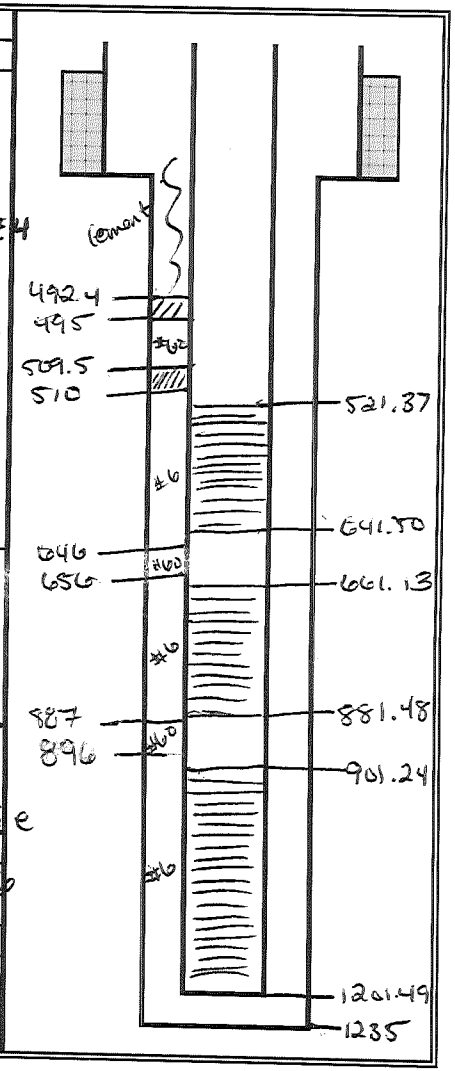
Screen Annular Volume (A_s): $(D^2-d_s^2)$ 0.005454 = 0.65 Ft³/Lin. Ft
Casing Annular Volume (A_c): $(D^2-d_c^2)$ 0.005454 = 0.65 Ft³/Lin. Ft
Casing/Cam.Tube Annular Volume (A_{c+ct}): $(D^2-d_c^2-d_{ct}^2)$ 0.005454 = — Ft³/Lin. Ft

EQUATIONS

2,700 lbs. Silica Sand = 1 cubic yard = 27 cubic feet
[1] Volume of bag (Ft^3) = bag weight/100
[2] Calculated depth = Previous Calculated depth - (v/A)

Bentonite Sack = 0.69 ft³
Silica Sand Super Sack = 3000 lbs.

No.	✓	Weight of Bag (lbs.)	Volume of Bag[1] (v) (ft³)	Total Vol. of Bags (ft³)	Calculated Depth[2] (ft bls)	Tagged Depth (ft bls)	Comments	Tremie
1	✓	3000	30	30	1197	—	#6 SS #1	1208
2	✓	3000	30	60	1151	1156	#6 SS #2	1177, 1146
3	✓	3000	30	90	1124 *	—	#6 SS #3	1115
4	✓	3000	30	120	1092 *	1097	#6 SS #4	1085
5	✓	3000	30	150	1060 *	NA	#6 SAND #5	1023
6	✓	3000	30	180	1028 *	1051	#6 SAND #6	1023
7	✓	3000	30	210	~~988~~ 996 *	NA	#6 SAND #7	992



Bentonite PEL PLUG

*Aug 14" borehole based on caliper log (0.93 ft³/linear foot)
□ 13" borehole = 0.75 ft³/ln Ft

HALEY ALDRICH

ESTIMATED ANNULAR MATERIAL RECORD (Continued)

Project Name: FCI **Project No.:** 129687-007 **Geologist:** C. Grush / S. Kaney
Well No.: I-01 **Date:** 3-13-18

No.	✓	Weight of Bag (lbs.)	Volume of Bag[1](v) (ft^3)	Total Vol. of Bags (ft^3)	Calculated Depth[2] (ft bls)	Tagged Depth (ft bls)	Comments	TREMIE
8	✓	3000	30	240	~~956~~ *964	996	#6 SAND #8	975
9	✓	3000	30	270	932*	NA	#6 SAND #9	934
10	✓	3000	30	300	900*	961	#6 SAND #10	934
11	✓	3000	30	330	944.5□	—	#6 SAND #11	901
12	✓	3000	30	360	928 ▽	919	#6 SAND #12	901, 868
13	✓	3000	30	360	900 ~~902~~**	~~900~~ 897	#6 SAND #13	
		—	—	—	—	902	Swab 1100 - 1200 x 15 min	
		—	—	—	—	902	Swab 1100 - 1200 x 10 min	
		—	—	—	—	905	Swab 1000 - 1100 x 15 min	
		—	—	—	—	905	Swab 1000 - 1100 x 10 min	
14	✓	1500	~~30~~ 15	375	896**	896	#6 SAND #14 1/2 Sack	
		—	—	—	—	~~900~~ 897	Swab 900 - 1000 x 15 min	
~~15~~		~~134~~	~~1.34~~	~~376.4~~		897	Swab x 15 min 900 - 1000	
15	✓	134	1.34	376.4	895	896	x 2 5 gal BUCKETS #6	
16	✓	~~1250~~ 1300	~~12.5~~ 13	389.5	888**	887	x 26 50 lbs bgs #6	881
17	✓	1500	15	404.5	878**	NA	1/2 SUPER SACK #6 14	936
18	✓	3000	30	434.5	860**	855	#6 SAND 15	836
19	✓	3000	30	474.5	838.5▵	NA	#6 SAND 16	804
20	✓	3000	30	504.5	822 ▵	806	#6 SAND 17	804
21	✓	3000	30	534.5	791°	NA	#6 SAND 18	773
22	✓	3000	30	564.5	776°	~~743~~ 781	#6 SAND 19	773
23	✓	3000	30	594.5	764.5▵	NA	#6 SAND 20	743

Notes:
* 14" bore hole 0.95 ft^3/ln ft
□ CALCULATED DEPTH BASED ON PREVIOUS TAG AND AVG 19" BOREHOLE 1.80 ft^3/ln ft
▽ Avg 19" Borehole 1.80 ft^3/ln ft
° PREVIOUS CALCULATION WITH 20" borehole 2.01 ft^3/ln ft
** Based on previous tag, based on avg 18" (1.63 ft^3/linear foot)

ESTIMATED ANNULAR MATERIAL RECORD (Continued)

Project Name: FCI **Project No.:** 129687-007 **Geologist:** C. Guisti / S. Kaney
Well No.: I-01 **Date:** 3-15-18

No.	✓	Weight of Bag (lbs.)	Volume of Bag[1](v) (ft^3)	Total Vol. of Bags (ft^3)	Calculated Depth[2] (ft bls)	Tagged Depth (ft bls)	Comments	Tremie
24	✓	3000	30	624.5	748△	757	#6 SAND #21	743
25	✓	3000	30	654.5	742 ○	—	#6 Sand #22	
26	✓	3000	30	684.5	727 ○	733	#6 Sand #23	
27	✓	3000	30	714.5	720□	—	#6 sand #24	680
28	✓	3000	30	744.5	707□	703	#6 Sand #25	
29	✓	3000	30	774.5	690□	—	#6 Sand #26	648
30	✓	3000	30	804.5	677□	676	#6 Sand #27	
31	✓	3000	30	834.5	663□	664	#6 Sand #28	
32	✓	1500	15	849.5	657□	658	#6 Sand #29 ½ bag	
		—	—	—	—	660	Swab 770'-880' x 15min	
		—	—	—	—	661	Swab 770'-880' x 10min	
		—	—	—	—	661	Swab 770'-880' x 10min	
33	✓	750	7.5	857	657.5□	658	#6 sand #29 ¼ bag	
						658	wash x15 MIN 770-880	
34	✓	268	2.68	860	657○	656	x4 5gal buckets #6 SAND	648
35	✓	1500	15	875	649.5□	651	x30 50 lbs bags #60 sand	648
36	✓	850	8.5	883.5	647○	646	x17 50 lbs bags #60 sand	648/647
37	✓	3000	30	913.5	631○	NA	#6 SAND 30	607
38	✓	3000	30	943.5	616○	NA	#6 SAND 31	607
39	✓	482	4.82	948.5	613.5○	618	#6 SAND (29)	607
40	✓	3000	30	978.5	601.5▽	N/A	#6 SAND 32	586
41	✓	3000	30	1008.5	585▽	578	#6 SAND 33	586

Notes:
▽ based on previous tag and 19" borehole (1.80 ft3/lin ft)
○ based on previous tag and 20" borehole (2.01 ft3/linear foot)
□ based on previous tag and dug 21" borehole (2.27 ft3/linear foot)

712

HALEY ALDRICH

ESTIMATED ANNULAR MATERIAL RECORD (Continued)

Project Name: FC 1 **Project No.:** 129687-007 **Geologist:** 3-16-17
Well No.: I-01 **Date:** C. [illegible] / S. [illegible]

No.	✓	Weight of Bag (lbs.)	Volume of Bag[1](v) (ft³)	Total Vol. of Bags (ft³)	Calculated Depth[2] (ft bls)	Tagged Depth (ft bls)	Comments	Tremie ~~557~~
41	✓	3000	30	1038.5	565□	NA	#6 SAND 34	555
42	✓	3000	30	1068.5	552□	557	#6 SAND 35	555
43	✓	3000	30	1098.5	545◊	NA	#6 SAND 36	523
44	✓	3000	30	1128.5	533◊	532	#6 SAND 37	523
45	✓	3000	30	1158.5	515▽	510	#6 SAND 38	491
		—	—	—	—	527	Swab 521'-641' x 15min	
							~~Swab 521'-641' x 10min~~	
46	✓	3000	30	1188.5	509 °	508.3	#6 Sand #39	
		—	—	—	—	508.6	Swab 521'-641' x 10min	
		—	—	—	—	509.9	Swab 521'-641' x 10min	
		—	—	—	—	509.9	Swab 521'-641' x 10min	
47		0.67	0.67	1189.2	—	509.5	Bentonite PEL PLUG -1-5gal bucket	
48	✓	50	0.5	1199.2	498.8*	502	#60 sand - 50lb x 20	
49		50	0.5	1204.2	497 *	495	#60 Sand - 50lb x 10	
		—	—	—	—	492.4	Bentonite PEL PLUG - 1 - 5gal bucket	460
							Grout Cement	

Notes:
□ based on previous tag and 21" borehole (2.27 ft³/ln ft)
◊ based on previous tag and 22" borehole (2.47 ft³/ln ft)
▽ based on previous tag and 19" borehole (1.80 ft³/ln ft)
° based on previous tag and 18" borehole (1.63 ft³/linear foot)
* based on previous tag and 14" borehole (0.93 ft³/linear foot)

1.25

HALEY ALDRICH

CEMEX

58776429

I-01

Plant:	Begin Loading:	To Job:	Arrive Job:	Start Unload:	Finish Unload:	Leave Job:	Return Plant:
D0374103							

Customer Code: Customer Name: Customer Job Number: Order Code / Date:

Project Code: Project Name: Project P.O. Number: Order P.O. Number:

Ticket Date: Delivery Address: Map Page: Map/Row/Column:

Delivery Instructions: Dispatcher:

Ticket Number:
44355409

Due On Job:	Slump:	Truck Number:	Driver Number:	Driver Name:	End Use:

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT

☐ Cash ☐ Check ☐ Charge	Check # / Auth Code:	Signature of Driver Receiving Cash:	Cash Received:	Total COD Order Amount to Collect Without Standby Charges:

Comments:

WATER ADDED: _____ GAL YARDS IN DRUM: _____ WHEN ADDED.

_____ SIGNATURE

CURB LINE CROSSED AT OWNER'S/AGENT'S REQUEST:

_____ SIGNATURE

❑ LOAD WAS TESTED BY: _____

Notice: Our drivers will make every effort to place materials where the customer designates, but the Company assumes no responsibility for damages inside curb or property line. Customer agrees to the terms of sale and delivery and accepts concrete as is. Due to important factors which are out of our control after delivery, this Company will not accept any responsibility for the finished results. No credit for returned concrete. Buyers exceptions and claims shall be deemed waived unless made to us in writing within one business day after the receipt of materials.

SPECIAL TERMS: Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. **WARNING**: Product may cause skin and/or eye irritation. **CAUTION**: Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.

AUTHORIZED SIGNATURE:

Ⓧ

68UNIVERSAL

INVOICE

4107 3761

BASIC ENERGY SERVICES

3451 LeTourneau
Gillette, WY 82718
307-682-5258

Cementing Ticket No. 1719

Date	Customer Order No.		Sect.	Twp.	Range	Truck Called Out	On Location	Job Began	Job Completed
12-4--17						20:00	16:45	19:30	21:00

Owner	Contractor	Charge To
Florance Copper Mine	Hydro Resources	Hydro West

Mailing Address	City	State

Well No. & Farm	Place	County	State
~~R-09~~ I-01	copper mine	Pinal	AZ

Depth of Well	Depth of Job	Casing (New / Used)	Size / Weight	Size of Hole / Amt. and Kind of Cement	Cement Left in casing by / Request Necessity
502	500		14 3/4	20 inch type 2/5	0 feet

Kind of Job	Drillpipe / Tubing	Rotary / Cable	Truck No.
surface	2 7/8		28983

Price Reference No. _____
Price of Job 2541
Second Stage _____
Pump Truck Mileage 3825
P.U. Mileage 765
Other Charges _____
Total Charges 7,131.00

Remarks
Safety meeting held
hook up hose to tubing
pump 10 bbls of h2o ahead
mix and pump 620 sks of type2/5
release if any pressure (no pressure well on vac)
unhook hose from tubing
wash up in ground holding pit
released

THANK YOU

Cementer David Scott (Scotty) Lead Yield 1.38 Lead Wt. 14.6 Lead Water 6.8 SV 152
Helper Bryan Hammond Tail Yield _____ Tail Wt. _____ Lead Water _____ SV _____
District Gillette State Wy

The above job was done under supervision of the owner, operator, or his agent whose signature appears below.

Agent of contractor or operator

Sales Ticket for Materials Only

QUANTITY SACKS	BRAND AND TYPE	PRICE	TOTAL
16	Crew subsistance	[redacted]	[redacted]
10	Transportaton of cement	[redacted]	[redacted]
1	Lay down Cement storage TNK	500	[redacted]
			0.00
	LOG FOR I-01, R-09 GROUTED ON 12/12/17		0.00
			0.00
			0.00
	LAC		0.00
	9/11/18		0.00
			0.00
			0.00
			0.00
			0.00
Plugs			0.00

Equipment #	HRS			
28983	1.5	620	Handling & Dumping	2.44	[redacted]
84127	1		Mileage		0.00
			Sub Total		[redacted]
			Discount		
			Sales Tax		
			Total		

Signature of operator

I-01

BASIC ENERGY SERVICES

3451 LeTourneau
Gillette, WY 82718
307-682-5258

Cementing Ticket No. 1719 21388

Date	Customer Order No.		Sect.	Twp.	Range	Truck Called Out	On Location	Job Began	Job Completed
03-16-18							9:00	14:30	16:30

Owner	Contractor	Charge To
Florance Copper Mine	Hydro Resources	Hydro West
Mailing Address	**City**	**State**

Well No. & Form	Place	County	State
I- 01	copper mine	Pinal	AZ

Depth of Well	Depth of Job	Casing (New / Used)	Size / Weight	Size of Hole / Amt. and Kind of Cement	Cement Left in casing by / Request Necessity
1227	477		Size 5.5	14 / 2/5	0 feet

Kind of Job	Drillpipe / Tubing	Rotary / Cable	Truck No.
Injection Well	Tubing 2 7/8		28983

Price Reference No. _____
Price of Job 1210
Second Stage _____
Pump Truck Mileage 3825
P.U. Mileage 765
Other Charges _____
Total Charges 5,800.00

Remarks
safety meeting held
rig up to tubing with hose and valve
pump 5 bbls to clear tubing
pump and mix 320 sks type 2/5 cement
displace .5 bbl thru mixer
rig down from tubing
wash up in cellar
good cement to surface/Released till further notice (2 day min)
THANK YOU

Cementer Bryan Hammond Lead Yield 1.38 Lead Wt. 14.6 Lead Water 6.8 SV 78
Helper Daniel Johnson Tail Yield _____ Tail Wt. _____ Lead Water _____ SV _____
District Gillette State Wy

The above job was done under supervision of the owner, operator, or his agent whose signature appears below.

Rick Hacker
Agent of contractor or operator

Sales Ticket for Materials Only

QUANTITY SACKS	BRAND AND TYPE	PRICE	TOTAL
16	Crew subsistance	500	8,000.00
10	Transportaton of cement	150	1,500.00
			0.00
			0.00
			0.00
	P.O. # 152614		0.00
			0.00
	Expected 17.5 yds= 343 sks		0.00
	Used 320 sks		0.00
			0.00
			0.00
			0.00
			0.00
Plugs			0.00

Equipment #	HRS				
28983	1.5	320	Handling & Dumping	2.44	780.80
84127	1		Mileage		0.00
			Sub Total		16,080.80
			Discount		
			Sales Tax		
			Total		

Signature of operator Bryan G Hammond

APPENDIX E

Geophysical Logs

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY FLORENCE COPPER
WELL ID I-01
FIELD FLORENCE COPPER
COUNTY PINAL STATE ARIZONA

TYPE OF LOGS: E-LOG
MORE: NAT. GAMMA
LOCATION

SEC TWP RGE

OTHER SERVICES
CALIPER
TEMPERATURE
FLUID RESISTIVIT
SONIC
DEVIATION
GAMMA-NEUTRON

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL		G.L.

DATE	12-3-17 / 3-5-18	TYPE FLUID IN HOLE	MUD
RUN No	1 & 2	MUD WEIGHT	N/A
TYPE LOG	ELOG-NAT. GAMMA	VISCOSITY	N/A
DEPTH-DRILLER	1220 FT	LEVEL	FULL
DEPTH-LOGGER	1183 FT	MAX. REC. TEMP.	23.84 Deg C
BTM LOGGED INTERVAL	1183 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT.
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	M. QUINONES / A. OLSON	TOOL STRING/SN	GEOVISTA E-LOG SN 4035
WITNESSED BY	CHAD - H&A	LOG TIME:ON SITE/OFF SITE	5:15 PM

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT	24"	STEEL	SURFACE	40 FT
2	20"	40 FT	500 FT	14"	STEEL	SURFACE	500 FT
3	12 1/4"	500 FT	TOTAL DEPTH				

COMMENTS:

.

Tool Summary:

Date	12-3-17 / 3-5-18	**Date**	12-3-17 / 3-5-18	**Date**	12-3-17 / 3-5-18
Run No.	1	**Run No.**	2	**Run No.**	3
Tool Model	MSI COMBO TOOL	**Tool Model**	GEOVISTA E-LOG	**Tool Model**	COMPROBE GN
Tool SN	5543	**Tool SN**	4035 / 5019	**Tool SN**	1107
From	SURFACE	**From**	SURFACE	**From**	SURFACE
To	1183 FT	**To**	1183 FT	**To**	1183 FT
Recorded By	M. QUINONES	**Recorded By**	M. QUINONES	**Recorded By**	M. QUINONES
Truck No	900	**Truck No**	900	**Truck No**	900
Operation Check	3-5-18	**Operation Check**	3-5-18	**Operation Check**	3-5-18
Calibration Check	3-5-18	**Calibration Check**	3-5-18	**Calibration Check**	3-5-18
Time Logged	5:50 PM	**Time Logged**	6:45 PM	**Time Logged**	7:15 PM

Date	12-3-17 / 3-5-18	**Date**	12-3-17 / 3-5-18	**Date**	
Run No.	4	**Run No.**	5	**Run No.**	6
Tool Model	MSI 60MM SONIC	**Tool Model**	MSI DEVIATION	**Tool Model**	
Tool SN	5050	**Tool SN**	6002 / 3082	**Tool SN**	
From	SURFACE	**From**	SURFACE	**From**	
To	1183 FT	**To**	1183 FT	**To**	
Recorded By	M. QUINONES	**Recorded By**	M. QUINONES	**Recorded By**	
Truck No	900	**Truck No**	900	**Truck No**	
Operation Check	3-5-18	**Operation Check**	3-5-18	**Operation Check**	
Calibration Check	N/A	**Calibration Check**	N/A	**Calibration Check**	
Time Logged	8:10 PM	**Time Logged**	9:40 PM	**Time Logged**	

Additional Comments:

Caliper Arms Used: 16" **Calibration Points:** 8" & 23"

E-Log Calibration Range: 10-1000 OHM-M **Calibration Points:** 10 & 1000 OHM-M

Disclaimer:

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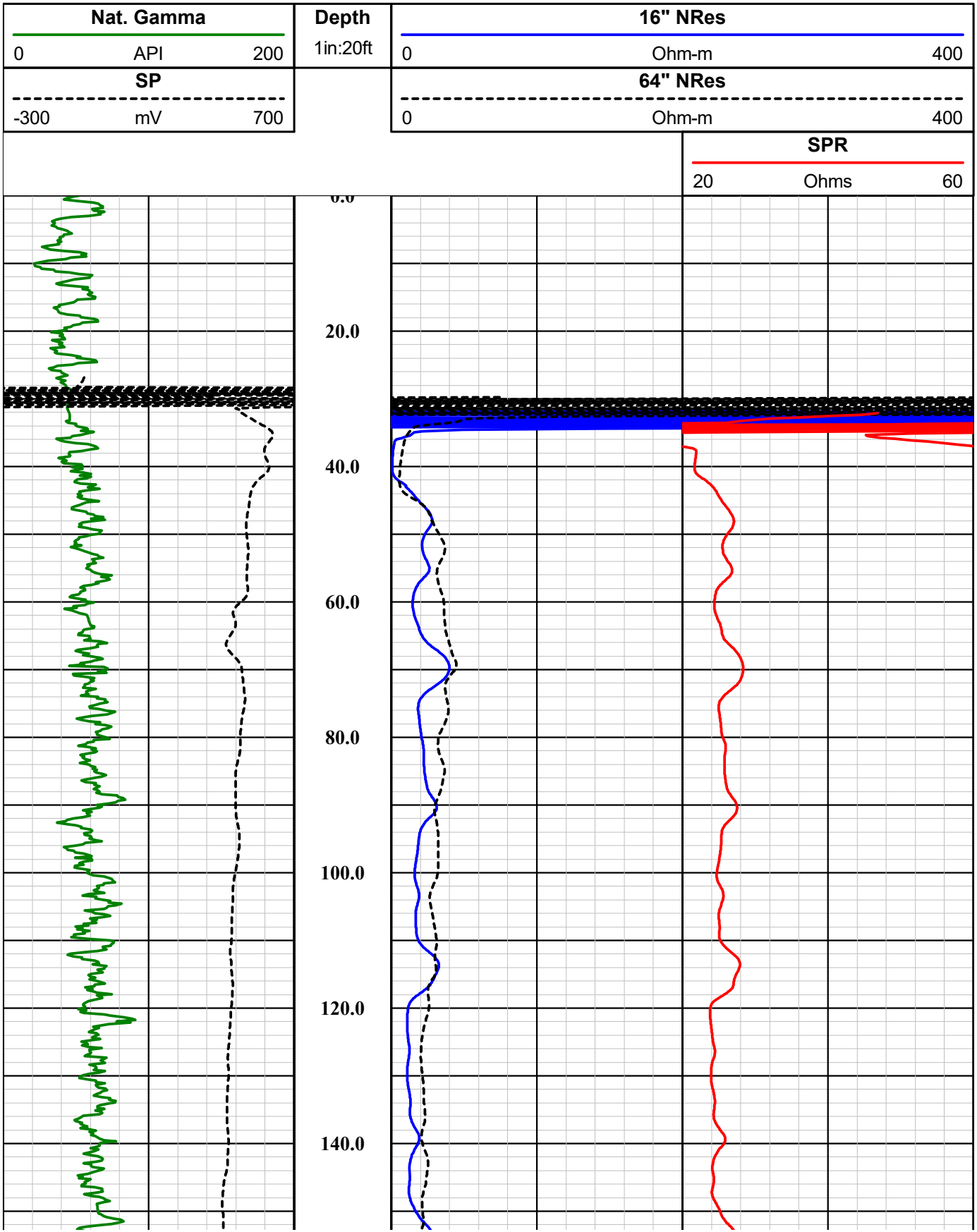

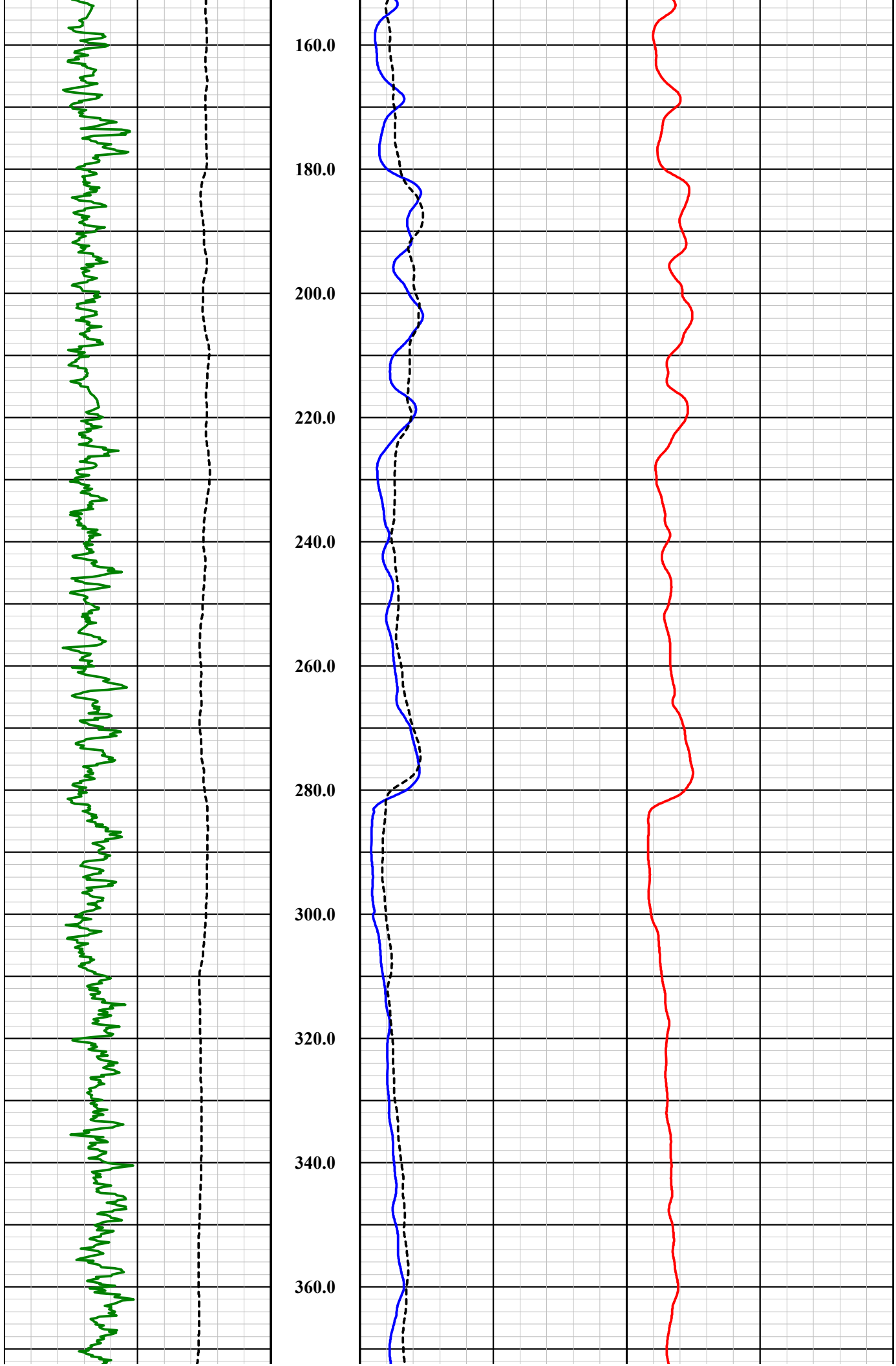
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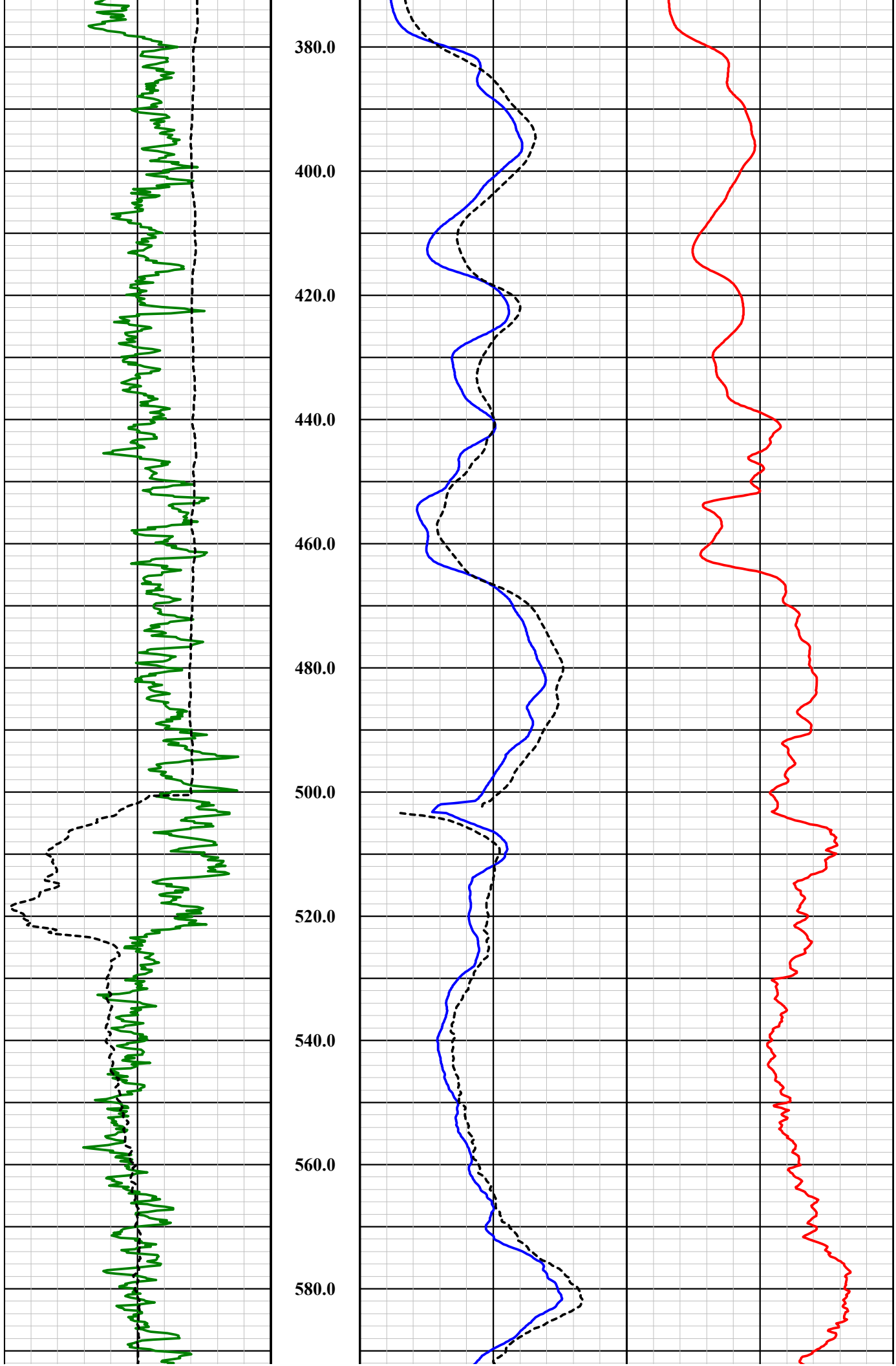
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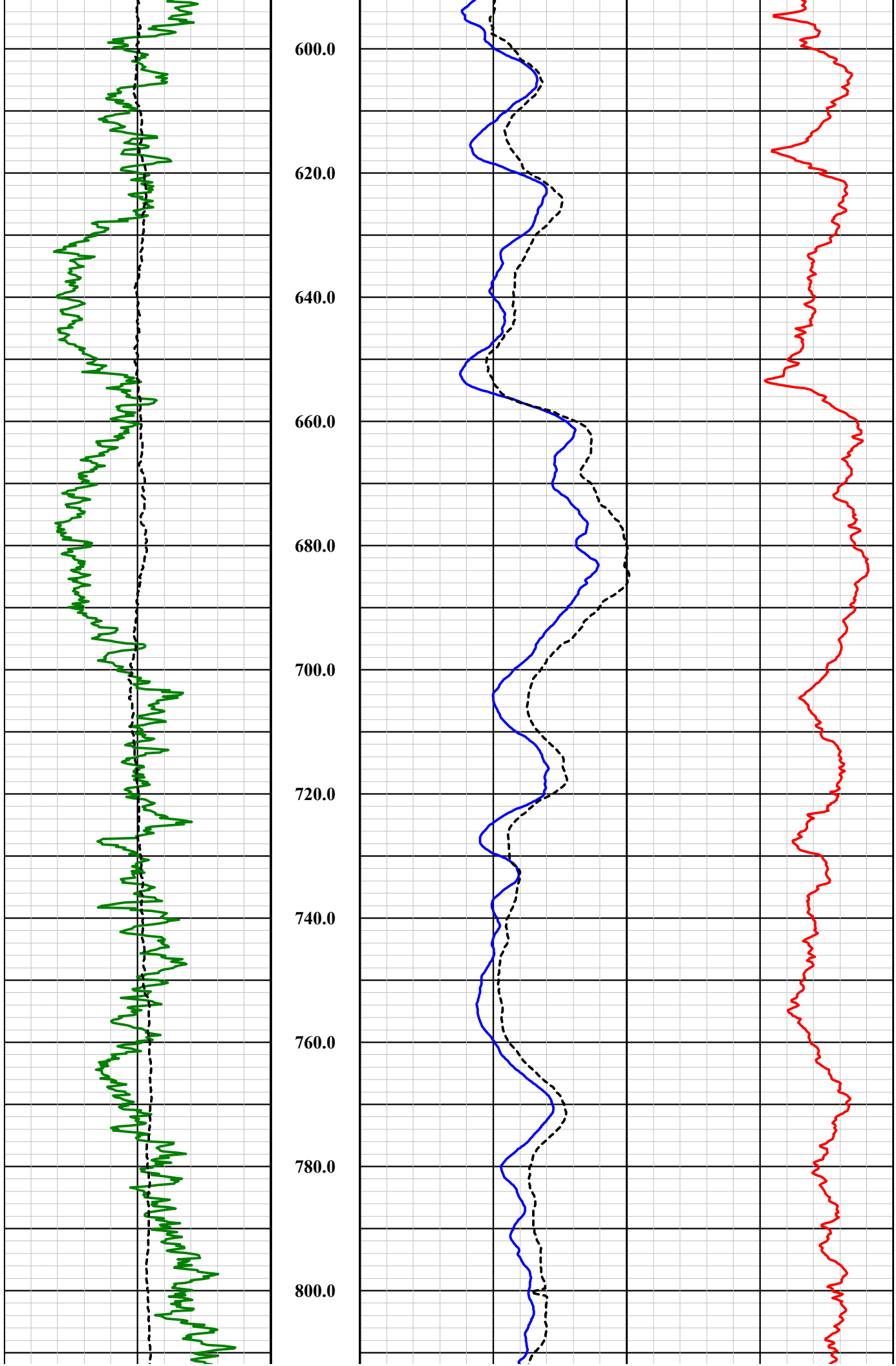
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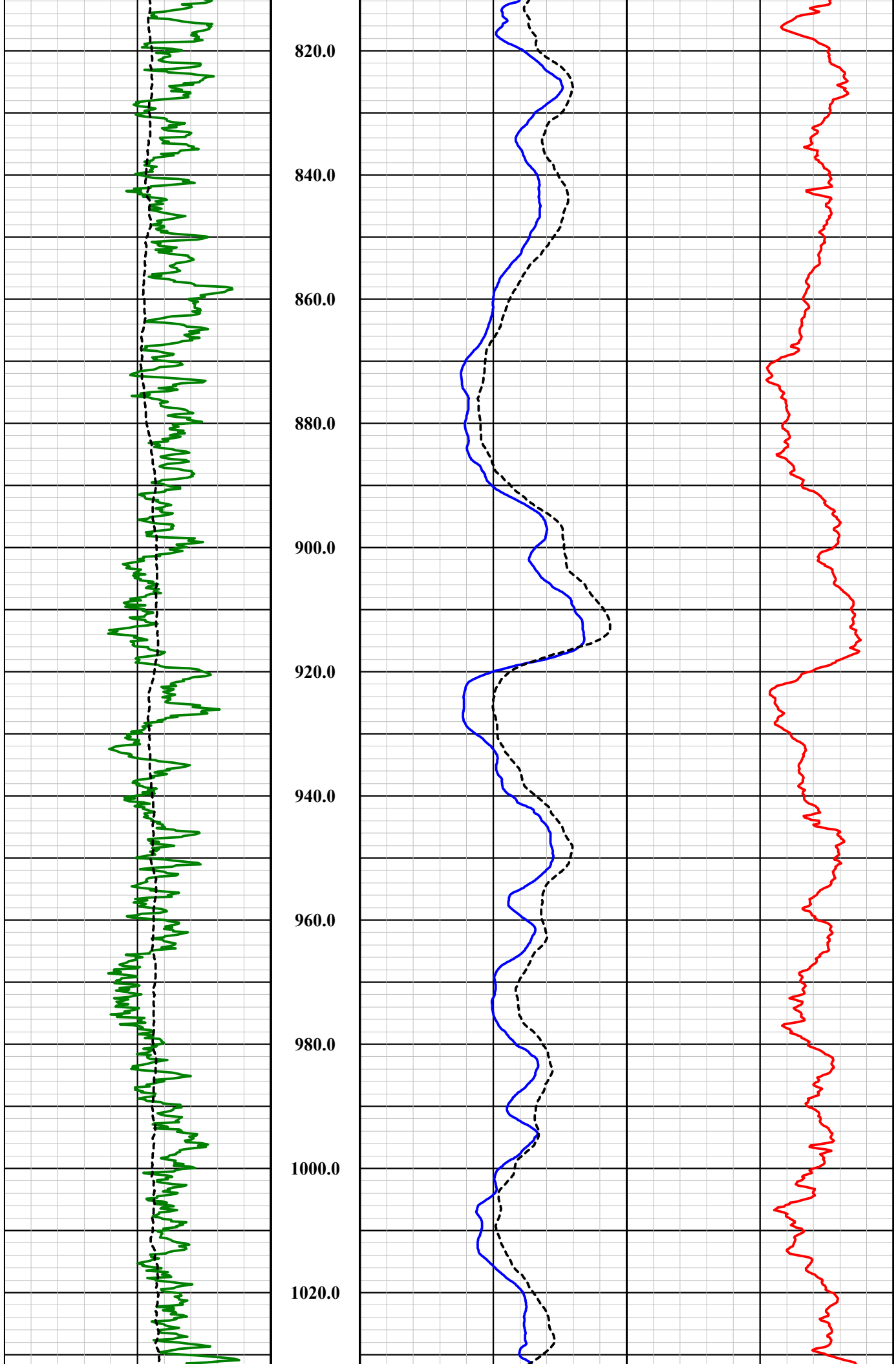
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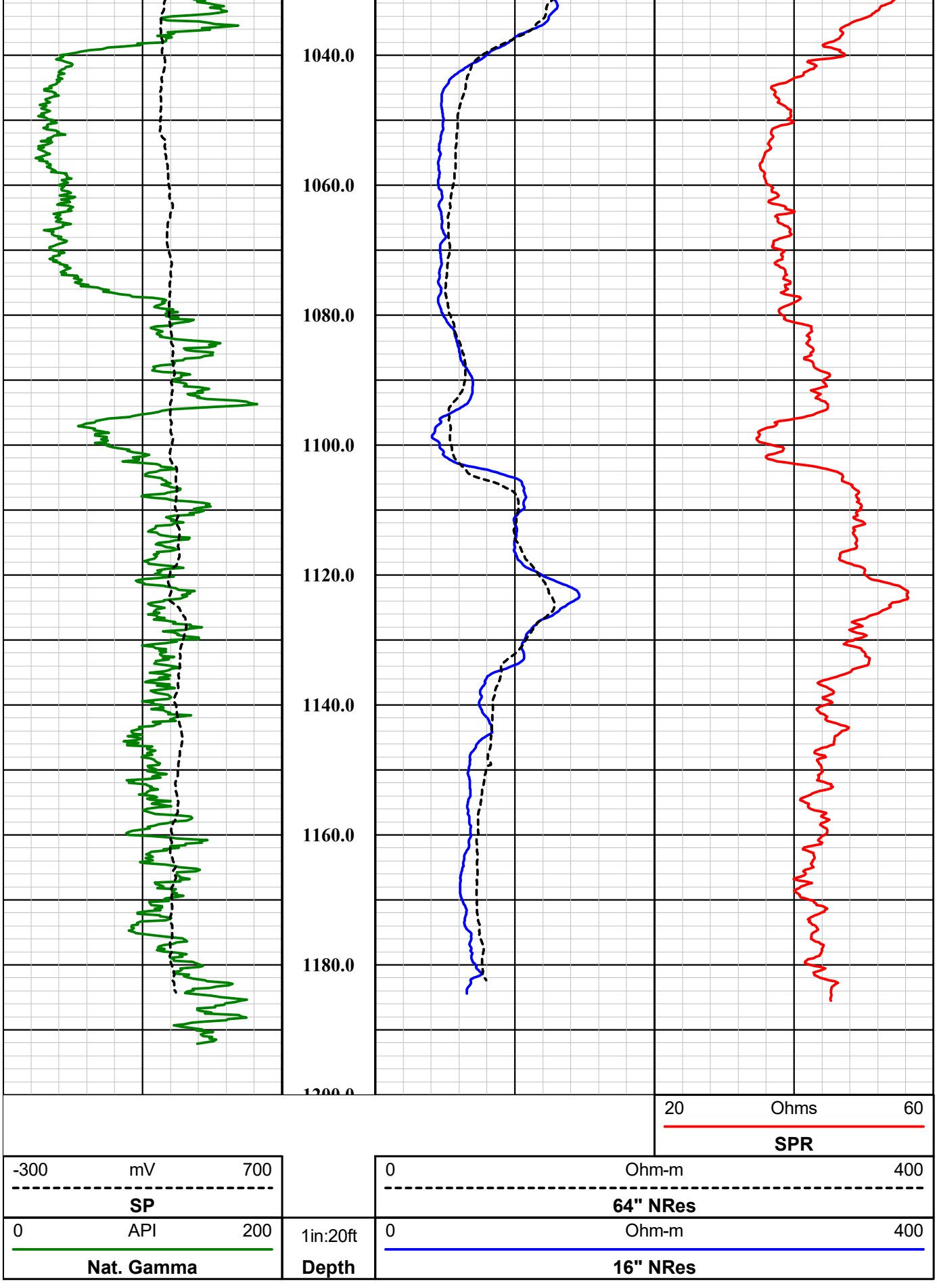


GeoVista E-Log Tool

Probe Top = Depth Ref.

Tool SN: 4035 & 4790

Bridle connects to wireline cablehead: Wireline armor is the B Electrode.

Four Conductor Probe Top

Bridle Electrode (N Electrode)

64" Normal Resistivity Electrode/Spontaneous Potential Electrode (M Electrode)

Probe Length = 2.3 m or 7.55 ft
Bridle Length = 10.0 m or 32.81 ft

Probe Weight = 7.0 kg or 15.4 lbs

Can only be collected in fluid

Isolation Bridle - Not shown in diagram but is necessary for operation

Electrode Measuring Points (from bottom of probe)
- Spontaneous Potential (SP): 0.65 m or 2.13 ft
- 16" Normal Resistivity (16" NRes): 0.50 m or 1.64 ft
- 64" Normal Resistivity (64" NRes): 1.10 m or 3.61 ft
- Single Point Resistance (SPR): 0.25 m or 0.82 ft

Temperature Rating: 80 Deg C (176 Deg F)
Presure Rating: 200 bar (2900 psi)

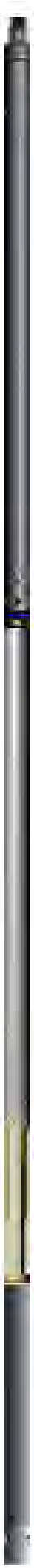
16" Normal Resistivity Electrode (M Electrode)

Current Electrode/Single Point Resistance (A Electrode)

1.65" or 42 mm Diameter

MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter

1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	I-01
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final E-Log Summary

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER
WELL ID	I-01
FIELD	FLORENCE COPPER
COUNTY	PINAL
STATE	ARIZONA

TYPE OF LOGS: GAMMA - NEUTRON
MORE: 3-ARM CALIPER

LOCATION

SEC TWP RGE

OTHER SERVICES
TEMPERATURE
FLUID RESISTIVITY
E-LOG
SONIC
DEVIATION

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL		G.L.

DATE	12-3-17 / 3-5-18	TYPE FLUID IN HOLE	MUD
RUN No	1 & 3	MUD WEIGHT	N/A
TYPE LOG	GAMMA-NEUTRON-CALIPER	VISCOSITY	N/A
DEPTH-DRILLER	1220 FT	LEVEL	FULL
DEPTH-LOGGER	1183 FT	MAX. REC. TEMP.	23.84 Deg C
BTM LOGGED INTERVAL	1183 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT.
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	M. QUINONES / A. OLSON	TOOL STRING/SN	COMPROBE GN SN 1107
WITNESSED BY	CHAD - H&A	LOG TIME:ON SITE/OFF SITE	5:15 PM

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT	24"	STEEL	SURFACE	40 FT
2	20"	40 FT	500 FT	14"	STEEL	SURFACE	500 FT
3	12 1/4"	500 FT	TOTAL DEPTH				

COMMENTS:

.

Tool Summary:

Date	12-3-17 / 3-5-18	**Date**	12-3-17 / 3-5-18	**Date**	12-3-17 / 3-5-18
Run No.	1	**Run No.**	2	**Run No.**	3
Tool Model	MSI COMBO TOOL	**Tool Model**	GEOVISTA E-LOG	**Tool Model**	COMPROBE GN
Tool SN	5543	**Tool SN**	4035 / 5019	**Tool SN**	1107
From	SURFACE	**From**	SURFACE	**From**	SURFACE
To	1183 FT	**To**	1183 FT	**To**	1183 FT
Recorded By	M. QUINONES	**Recorded By**	M. QUINONES	**Recorded By**	M. QUINONES
Truck No	900	**Truck No**	900	**Truck No**	900
Operation Check	3-5-18	**Operation Check**	3-5-18	**Operation Check**	3-5-18
Calibration Check	3-5-18	**Calibration Check**	3-5-18	**Calibration Check**	3-5-18
Time Logged	5:50 PM	**Time Logged**	6:45 PM	**Time Logged**	7:15 PM

Date	12-3-17 / 3-5-18	**Date**	12-3-17 / 3-5-18	**Date**	
Run No.	4	**Run No.**	5	**Run No.**	6
Tool Model	MSI 60MM SONIC	**Tool Model**	MSI DEVIATION	**Tool Model**	
Tool SN	5050	**Tool SN**	6002 / 3082	**Tool SN**	
From	SURFACE	**From**	SURFACE	**From**	
To	1183 FT	**To**	1183 FT	**To**	
Recorded By	M. QUINONES	**Recorded By**	M. QUINONES	**Recorded By**	
Truck No	900	**Truck No**	900	**Truck No**	
Operation Check	3-5-18	**Operation Check**	3-5-18	**Operation Check**	
Calibration Check	N/A	**Calibration Check**	N/A	**Calibration Check**	
Time Logged	8:10 AM	**Time Logged**	9:40 AM	**Time Logged**	

Additional Comments:

Caliper Arms Used: 16" **Calibration Points:** 8" & 23"

E-Log Calibration Range: 10-1000 OHM-M **Calibration Points:** 10 & 1000 OHM-M

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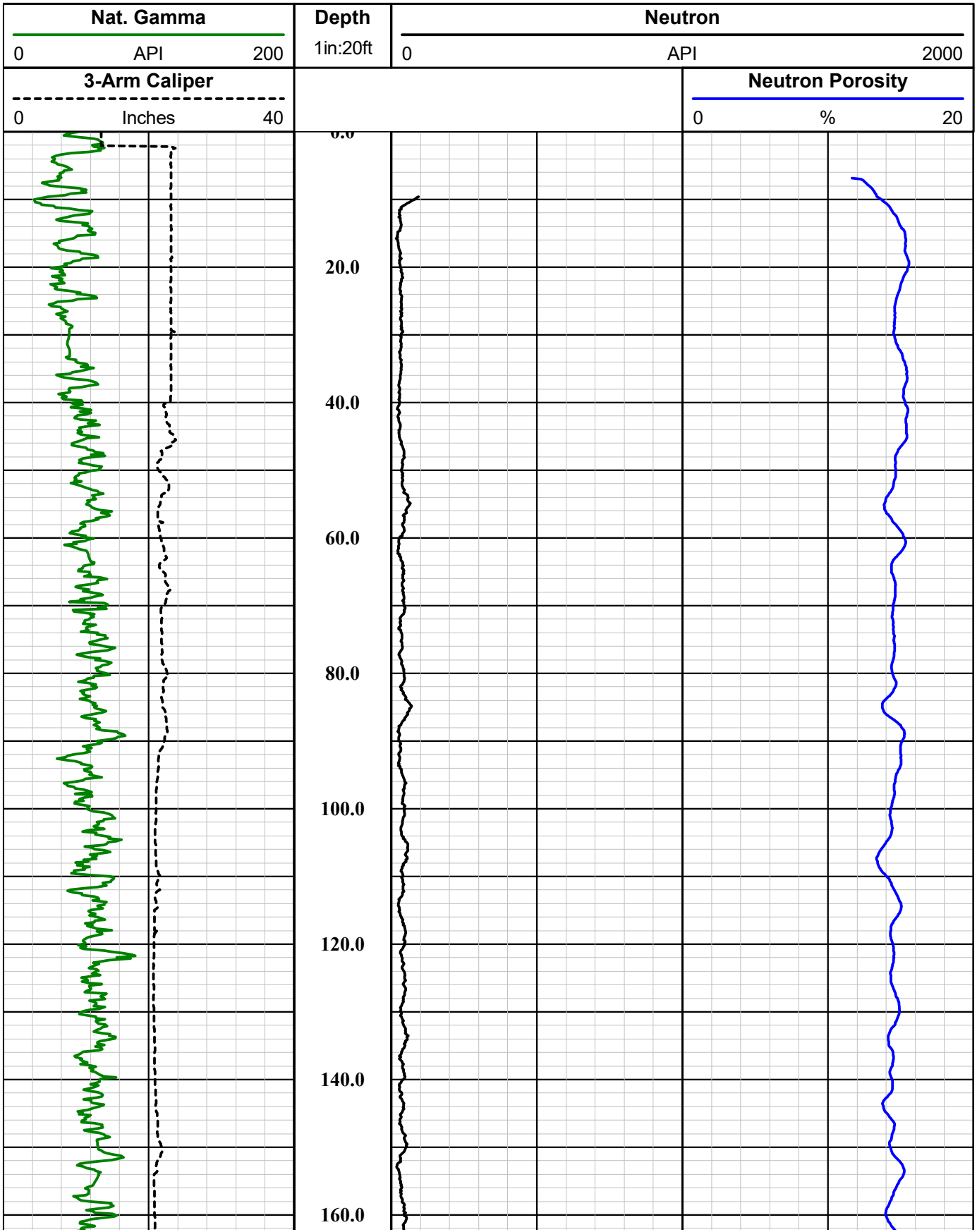

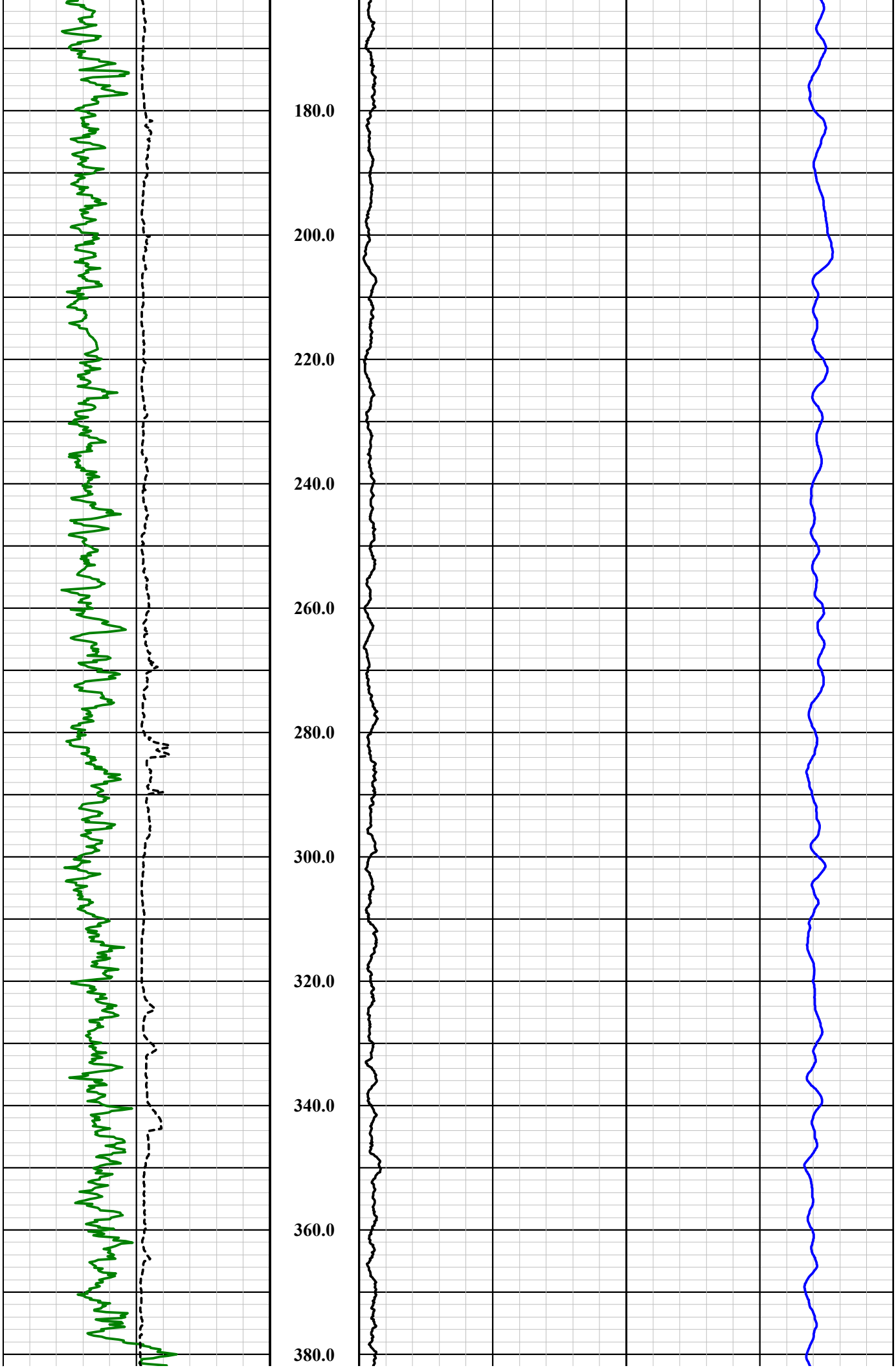
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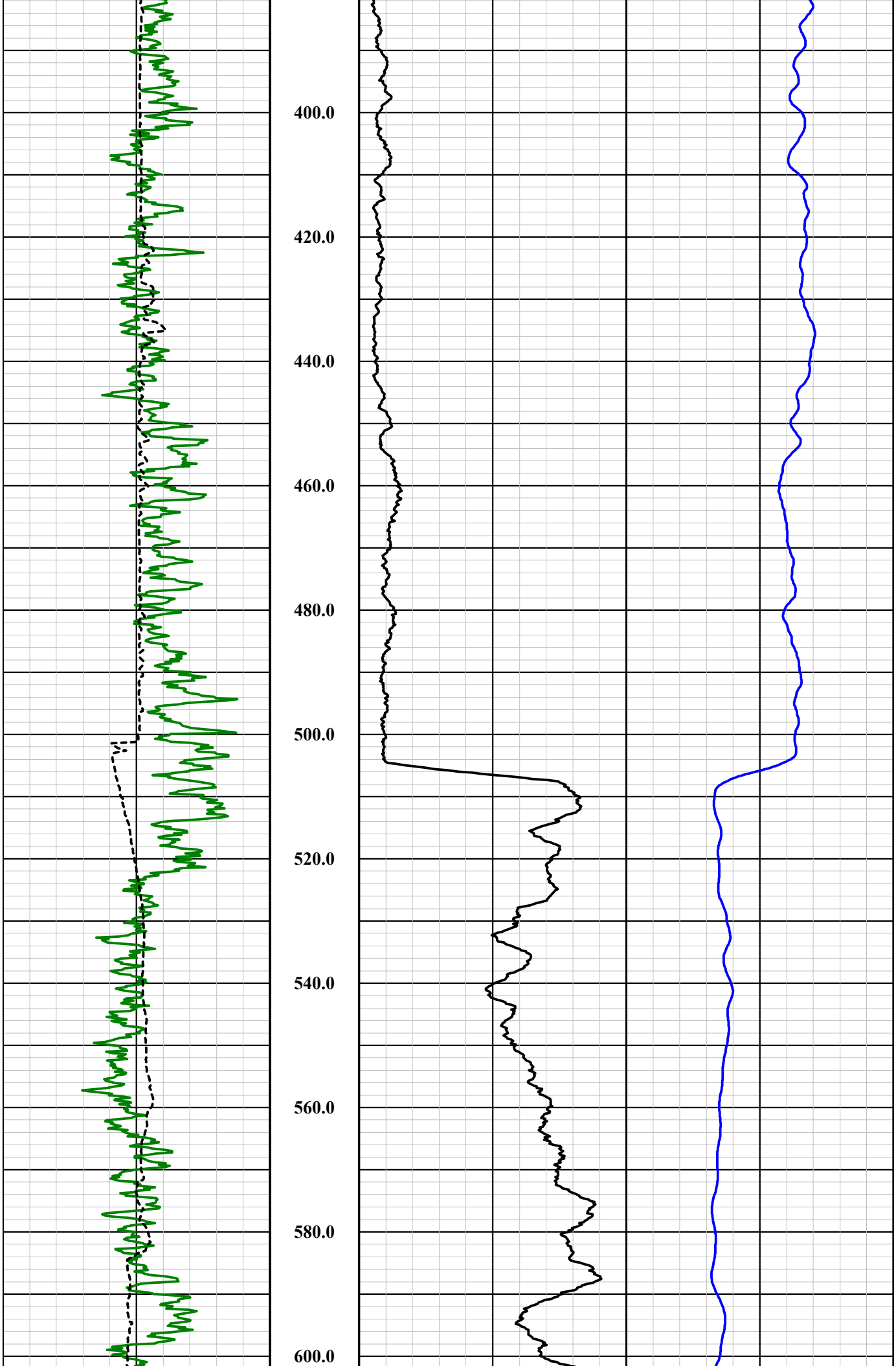
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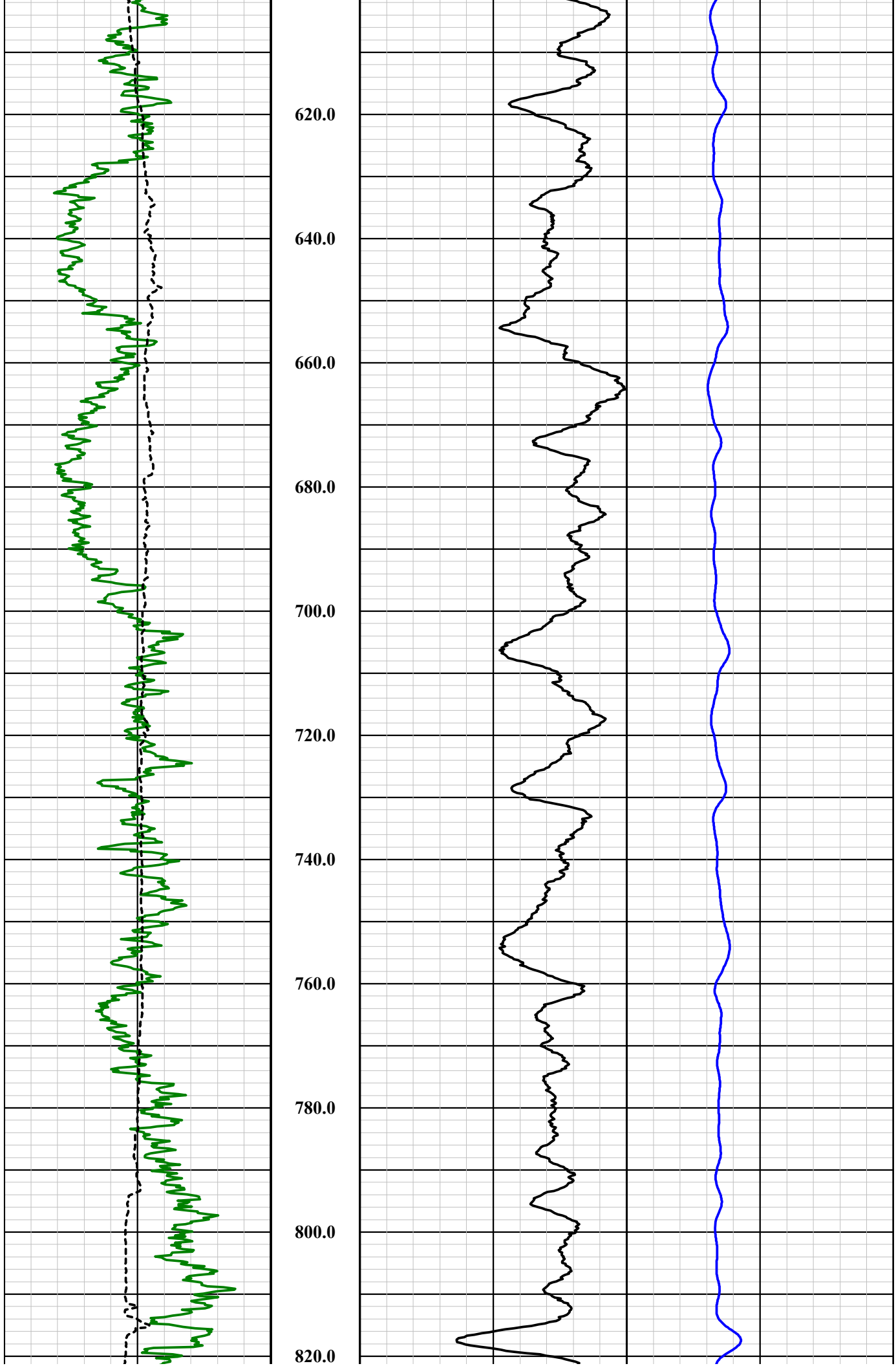
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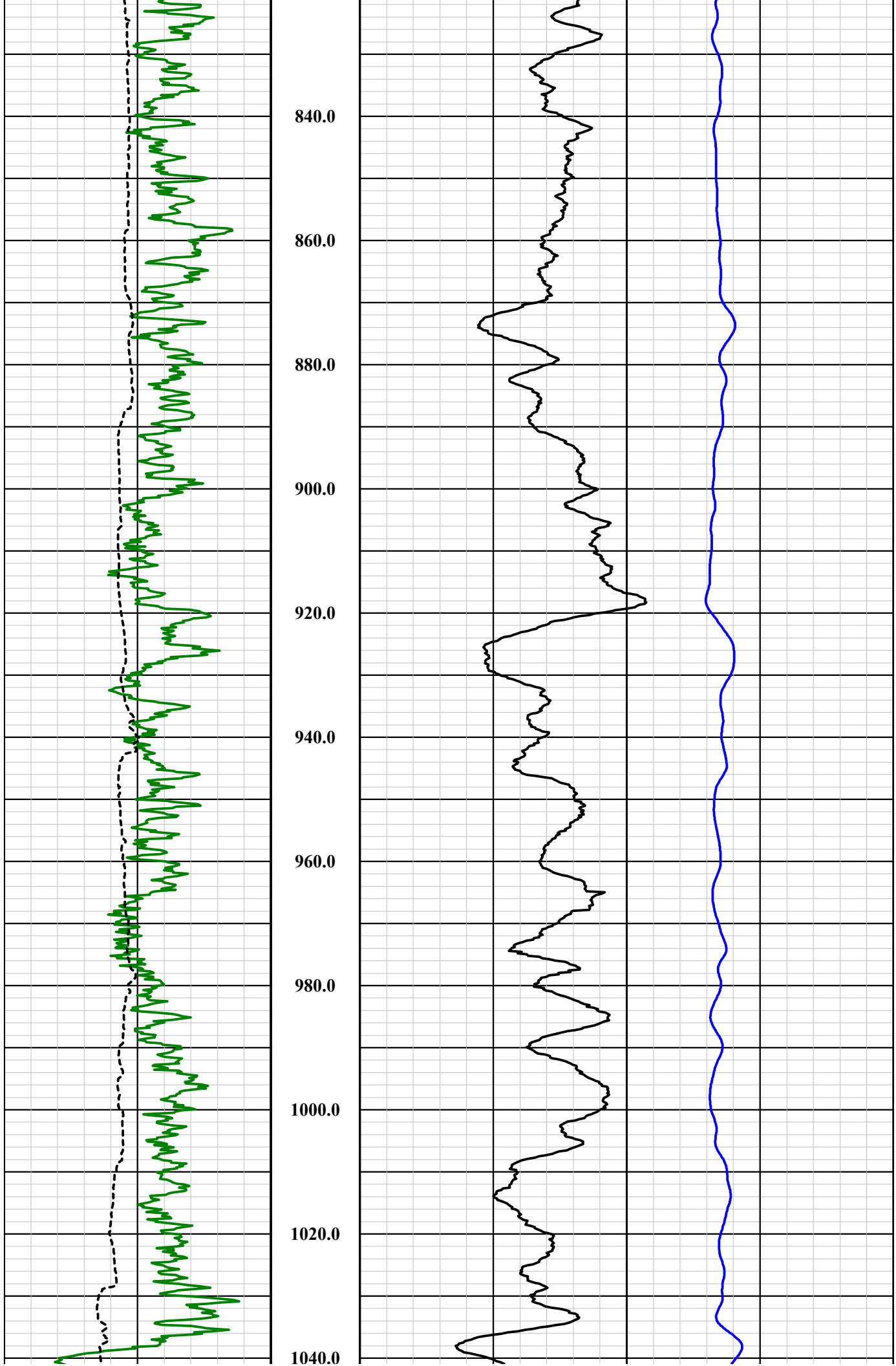
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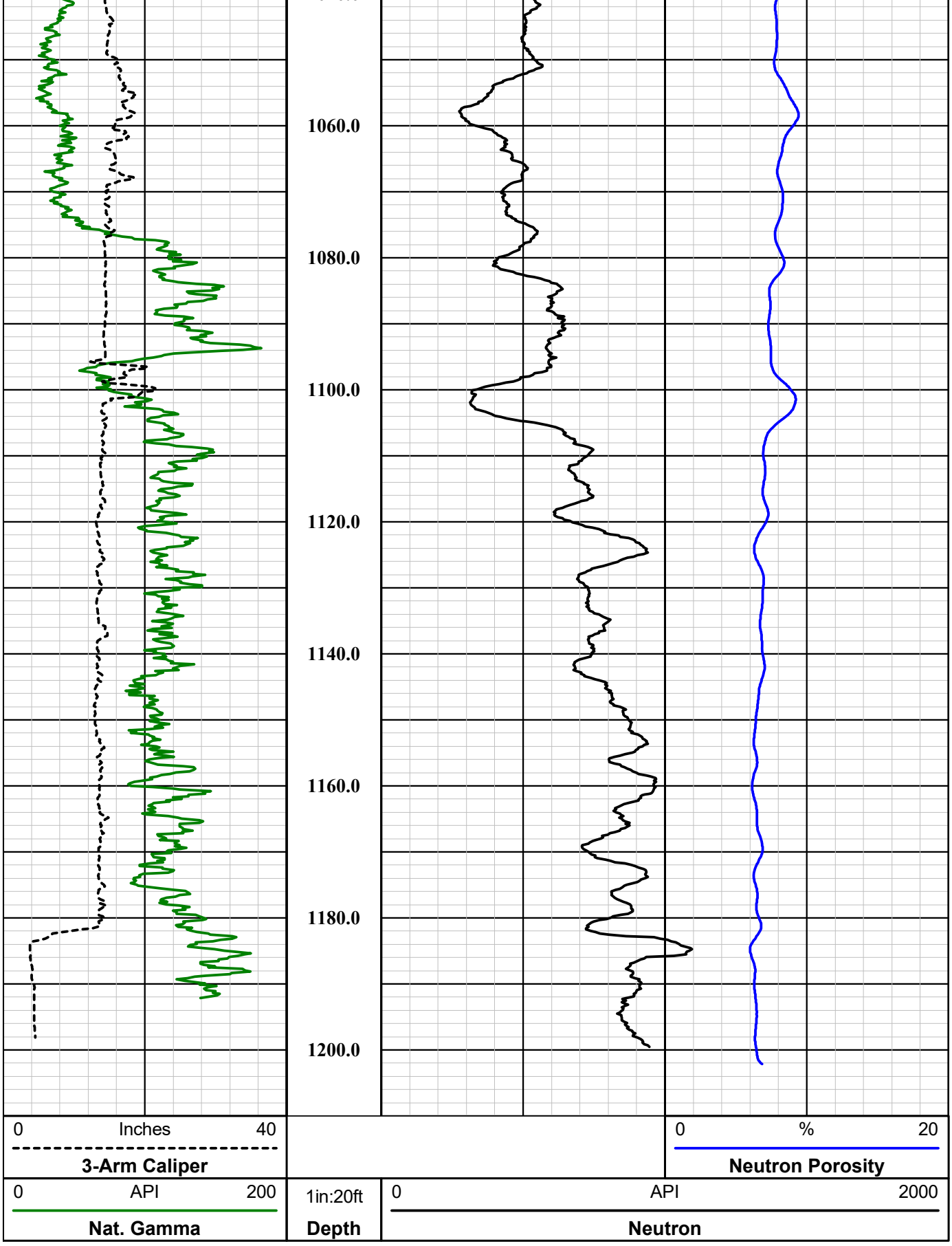


Comprobe Gamma-Neutron

Probe Top = Depth Ref.

Tool SN: 1107 & 3555

Four Conductor Probe Top

Probe Length = 2.82 m or 9.25 ft
Probe Weight = 18.1 kg or 40.14 lbs

Gamma Detector = 0.66 m (26 in)

Temperature Rating: 148.9 Deg C (300 Deg F)
Presure Rating: 689.5 bar (10,000 psi)

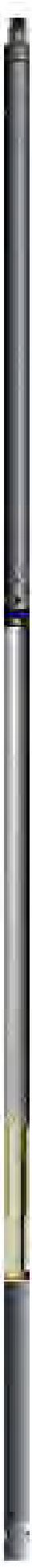
Neutron Detector = 2.61 m (102.8 in)

Source

1.625" or 41.275 mm Diameter

MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	I-01
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final Gamma-Neutron Summary

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY FLORENCE COPPER
WELL ID I-01
FIELD FLORENCE COPPER
COUNTY PINAL STATE ARIZONA

TYPE OF LOGS: GAMMA - CALIPER
MORE: TEMP. / FLUID RES.

LOCATION

SEC TWP RGE

OTHER SERVICES
E-LOG
SONIC
DEVIATION
GAMMA - NEUTRON

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL		G.L.

DATE	12-3-17 / 3-5-18	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	GAMMA-CALIPER-TFR	VISCOSITY	N/A
DEPTH-DRILLER	1220 FT	LEVEL	FULL
DEPTH-LOGGER	1183 FT	MAX. REC. TEMP.	23.84 Deg C
BTM LOGGED INTERVAL	1183 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT.
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	M. QUINONES / A. OLSON	TOOL STRING/SN	MSI COMBO TOOL SN 4183
WITNESSED BY	CHAD - H&A	LOG TIME:ON SITE/OFF SITE	5:15 PM

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT	24"	STEEL	SURFACE	40 FT
2	20"	40 FT	500 FT	14"	STEEL	SURFACE	500 FT
3	12 1/4"	500 FT	TOTAL DEPTH				

COMMENTS:

.

Tool Summary:

Date	12-3-17 / 3-5-18	**Date**	12-3-17 / 3-5-18	**Date**	12-3-17 / 3-5-18
Run No.	1	**Run No.**	2	**Run No.**	3
Tool Model	MSI COMBO TOOL	**Tool Model**	GEOVISTA E-LOG	**Tool Model**	COMPROBE GN
Tool SN	5543	**Tool SN**	4035 / 5019	**Tool SN**	1107
From	SURFACE	**From**	SURFACE	**From**	SURFACE
To	1183 FT	**To**	1183 FT	**To**	1183 FT
Recorded By	M. QUINONES	**Recorded By**	M. QUINONES	**Recorded By**	M. QUINONES
Truck No	900	**Truck No**	900	**Truck No**	900
Operation Check	3-5-18	**Operation Check**	3-5-18	**Operation Check**	3-5-18
Calibration Check	3-5-18	**Calibration Check**	3-5-18	**Calibration Check**	3-5-18
Time Logged	5:50 PM	**Time Logged**	6:45 PM	**Time Logged**	7:15 PM

Date	12-3-17 / 3-5-18	**Date**	12-3-17 / 3-5-18	**Date**	
Run No.	4	**Run No.**	5	**Run No.**	6
Tool Model	MSI 60MM SONIC	**Tool Model**	MSI DEVIATION	**Tool Model**	
Tool SN	5050	**Tool SN**	6002 / 3082	**Tool SN**	
From	SURFACE	**From**	SURFACE	**From**	
To	1183 FT	**To**	1183 FT	**To**	
Recorded By	M. QUINONES	**Recorded By**	M. QUINONES	**Recorded By**	
Truck No	900	**Truck No**	900	**Truck No**	
Operation Check	3-5-18	**Operation Check**	3-5-18	**Operation Check**	
Calibration Check	N/A	**Calibration Check**	N/A	**Calibration Check**	
Time Logged	8:10 PM	**Time Logged**	9:40 PM	**Time Logged**	

Additional Comments:

Caliper Arms Used: 16" **Calibration Points:** 8" & 23"

E-Log Calibration Range: 10-1000 OHM-M **Calibration Points:** 10 & 1000 OHM-M

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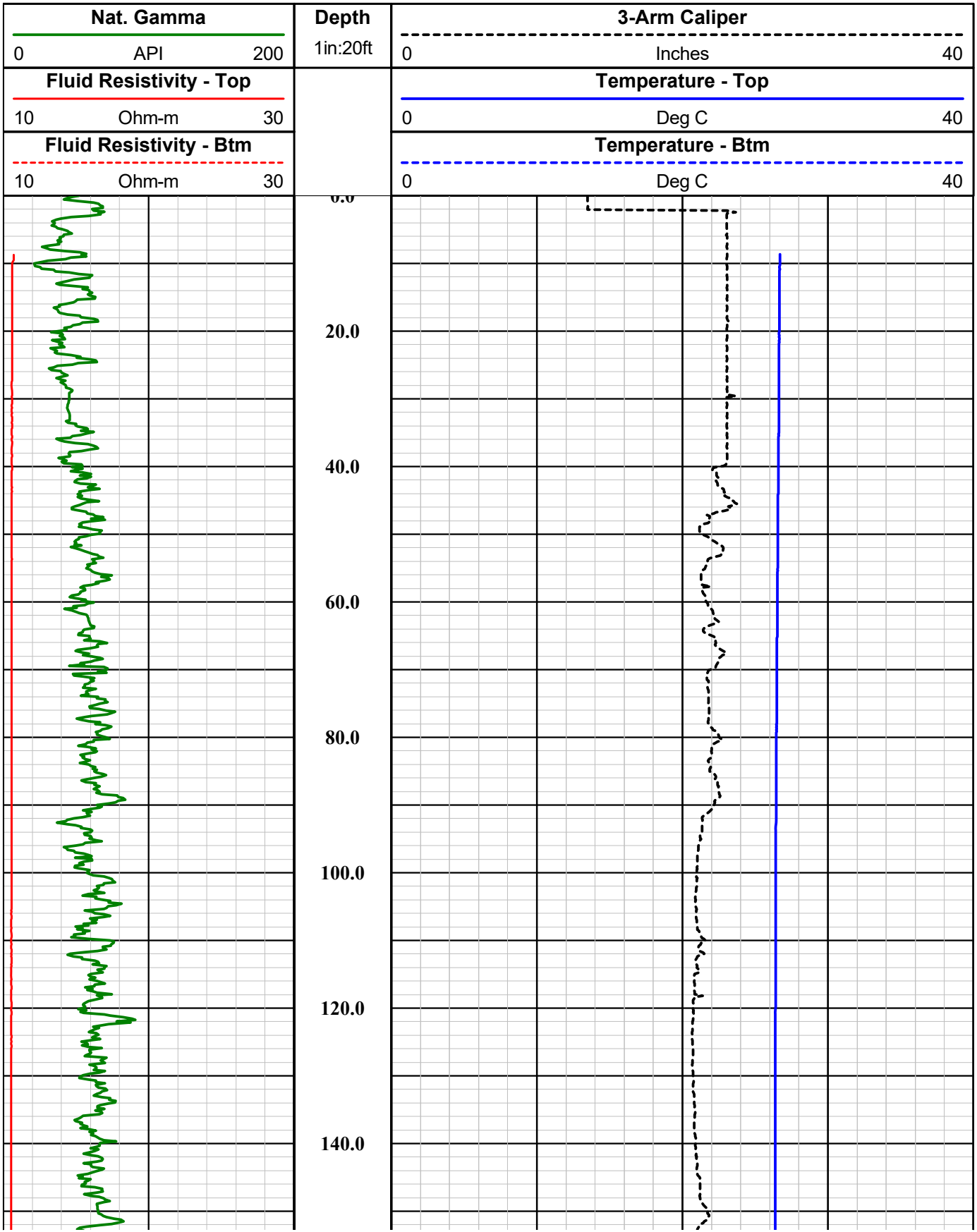

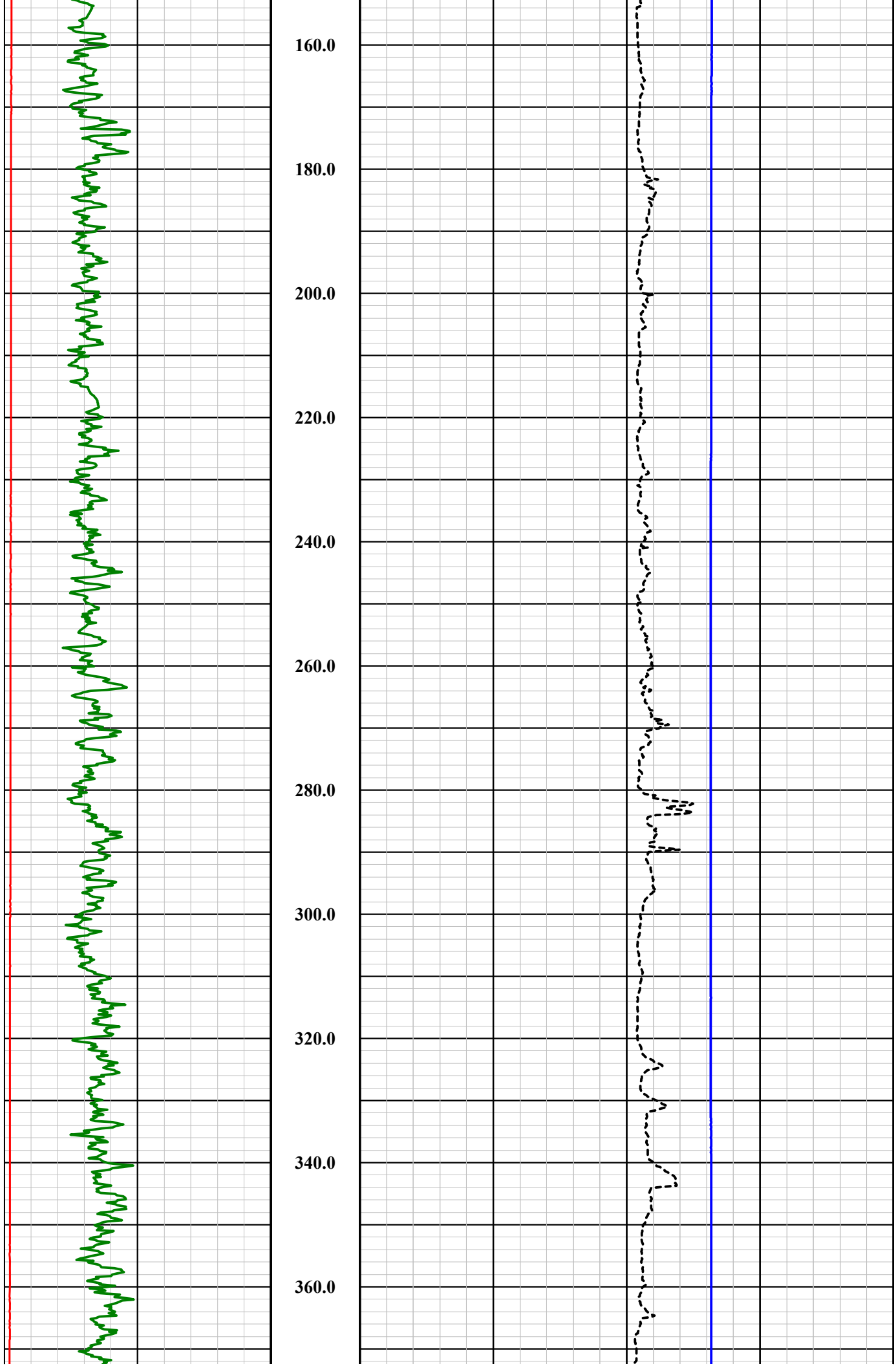
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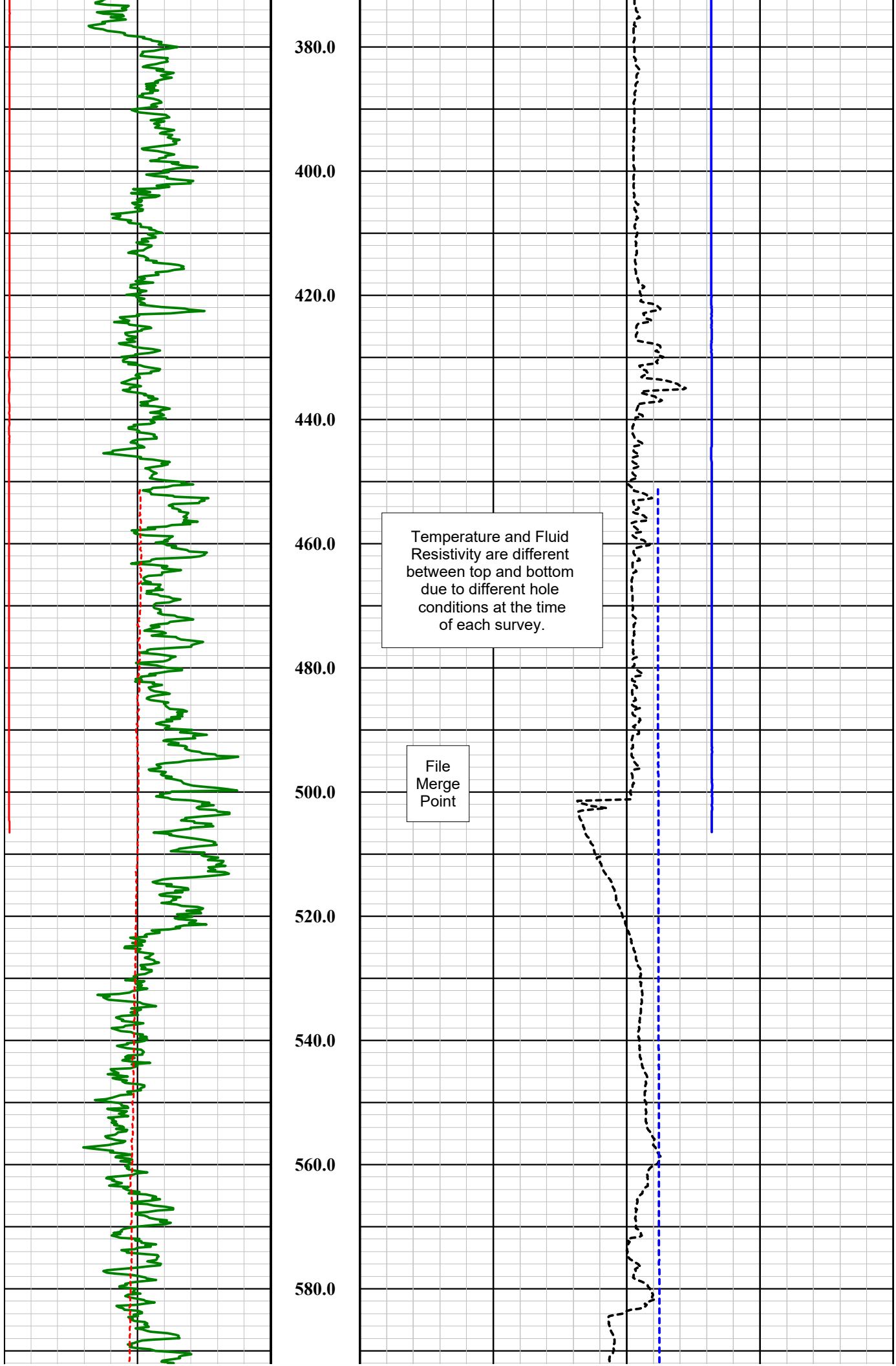
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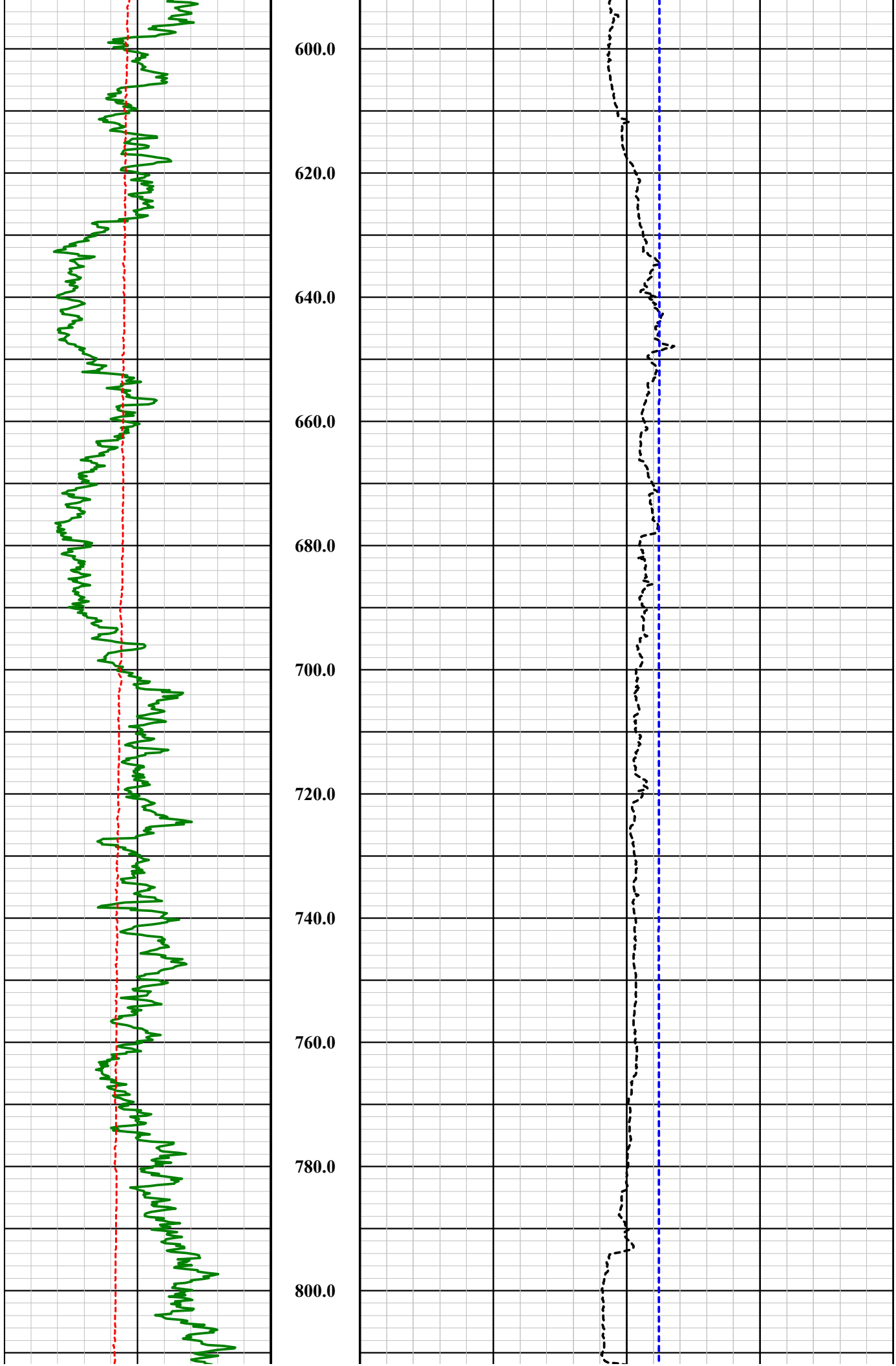
Temperature and Fluid Resistivity are different between top and bottom due to different hole conditions at the time of each survey.
File Merge Point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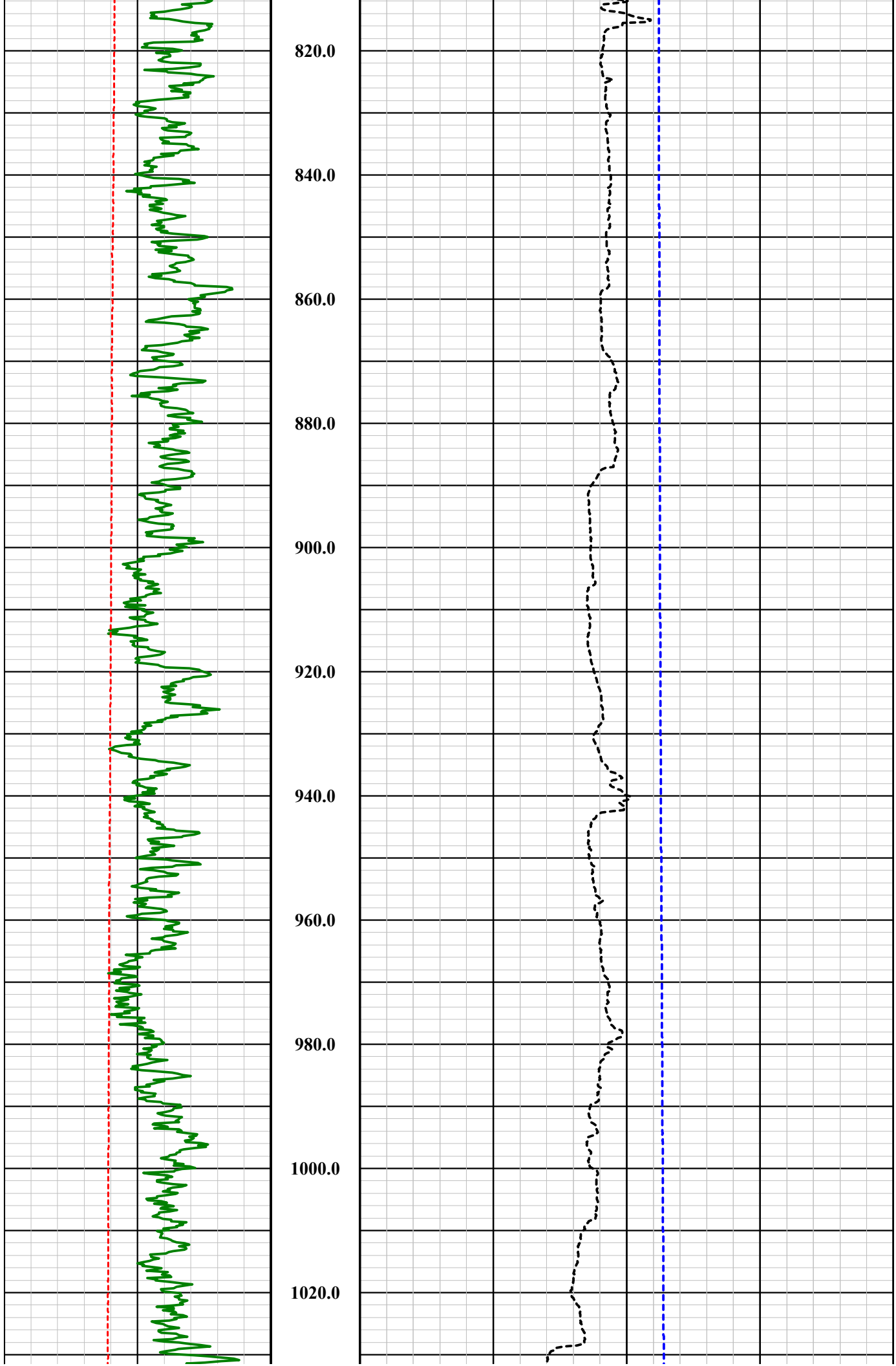
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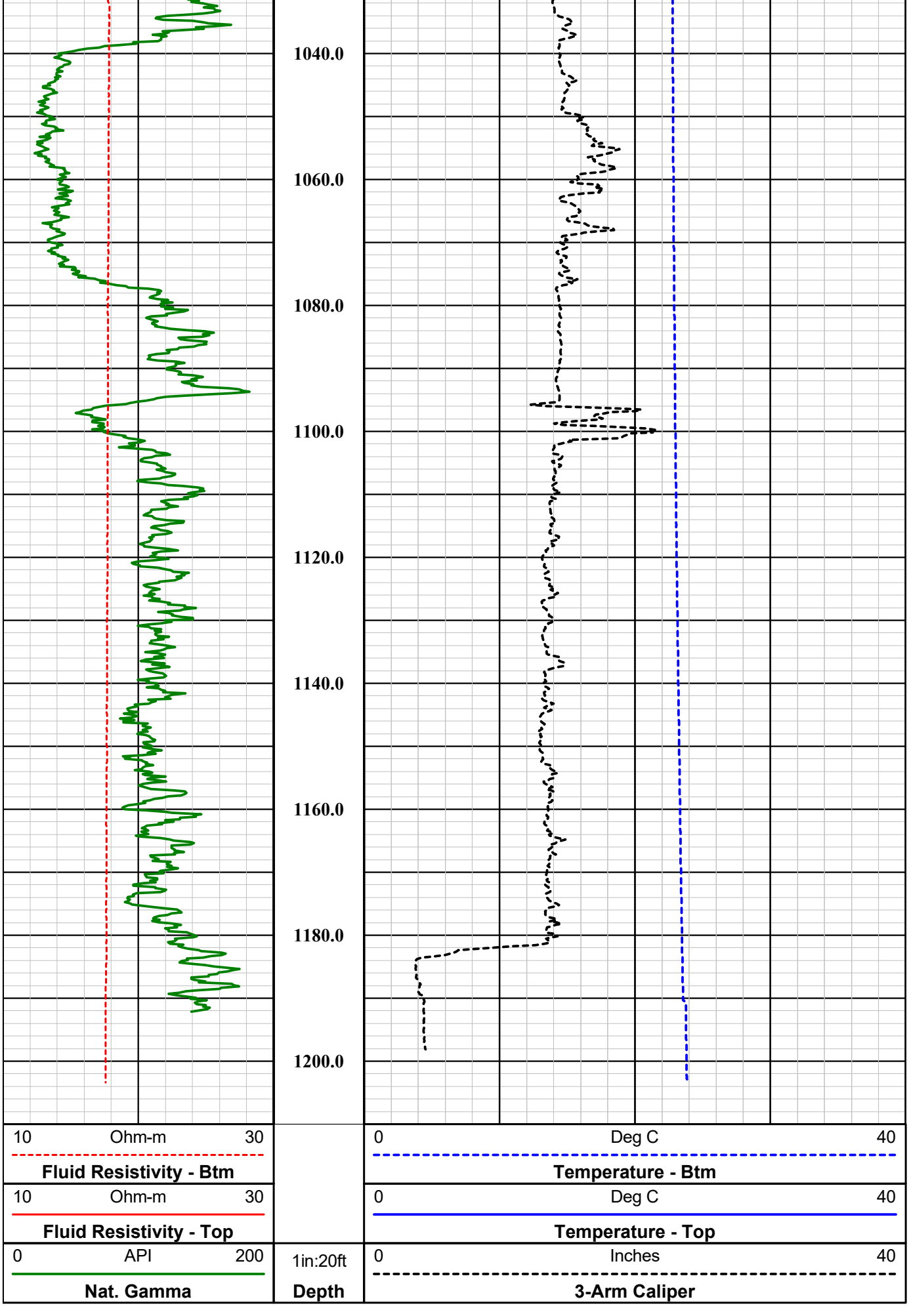
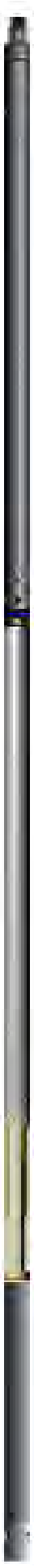


MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	I-01
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final GCT Summary

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER
WELL ID	I-01
FIELD	FLORENCE COPPER
COUNTY	PINAL
STATE	ARIZONA

TYPE OF LOGS: MSI 60MM SONIC
MORE: GAMMA - CALIPER

LOCATION

SEC TWP RGE

OTHER SERVICES
TEMPERATURE
FLUID RESISTIVITY
E-LOG
DEVIATION
GAMMA - NEUTRON

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL		G.L.

DATE	12-3-17 / 3-5-18	TYPE FLUID IN HOLE	MUD
RUN No	1 & 5	MUD WEIGHT	N/A
TYPE LOG	SONIC-GAMMA-CALIPER	VISCOSITY	N/A
DEPTH-DRILLER	1220 FT	LEVEL	FULL
DEPTH-LOGGER	1183 FT	MAX. REC. TEMP.	23.84 Deg C
BTM LOGGED INTERVAL	1183 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.25 FT
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	M. QUINONES / A. OLSON	TOOL STRING/SN	MSI 60MM SONIC SN 5050
WITNESSED BY	CHAD - H&A	LOG TIME:ON SITE/OFF SITE	5:15 PM

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT	24"	STEEL	SURFACE	40 FT
2	20"	40 FT	500 FT	14"	STEEL	SURFACE	500 FT
3	12 1/4"	500 FT	TOTAL DEPTH				

COMMENTS:

.

Tool Summary:

Date	12-3-17 / 3-5-18	**Date**	12-3-17 / 3-5-18	**Date**	12-3-17 / 3-5-18
Run No.	1	**Run No.**	2	**Run No.**	3
Tool Model	MSI COMBO TOOL	**Tool Model**	GEOVISTA E-LOG	**Tool Model**	COMPROBE GN
Tool SN	5543	**Tool SN**	4035 / 5019	**Tool SN**	1107
From	SURFACE	**From**	SURFACE	**From**	SURFACE
To	1183 FT	**To**	1183 FT	**To**	1183 FT
Recorded By	M. QUINONES	**Recorded By**	M. QUINONES	**Recorded By**	M. QUINONES
Truck No	900	**Truck No**	900	**Truck No**	900
Operation Check	3-5-18	**Operation Check**	3-5-18	**Operation Check**	3-5-18
Calibration Check	3-5-18	**Calibration Check**	3-5-18	**Calibration Check**	3-5-18
Time Logged	5:50 PM	**Time Logged**	6:45 PM	**Time Logged**	7:15 PM

Date	12-3-17 / 3-5-18	**Date**	12-3-17 / 3-5-18	**Date**	
Run No.	4	**Run No.**	5	**Run No.**	6
Tool Model	MSI 60MM SONIC	**Tool Model**	MSI DEVIATION	**Tool Model**	
Tool SN	5050	**Tool SN**	6002 / 3082	**Tool SN**	
From	SURFACE	**From**	SURFACE	**From**	
To	1183 FT	**To**	1183 FT	**To**	
Recorded By	M. QUINONES	**Recorded By**	M. QUINONES	**Recorded By**	
Truck No	900	**Truck No**	900	**Truck No**	
Operation Check	3-5-18	**Operation Check**	3-5-18	**Operation Check**	
Calibration Check	N/A	**Calibration Check**	N/A	**Calibration Check**	
Time Logged	8:10 PM	**Time Logged**	9:40 PM	**Time Logged**	

Additional Comments:

Caliper Arms Used: 16" **Calibration Points:** 8" & 23"

E-Log Calibration Range: 10-1000 OHM-M **Calibration Points:** 10 & 1000 OHM-M

Disclaimer:

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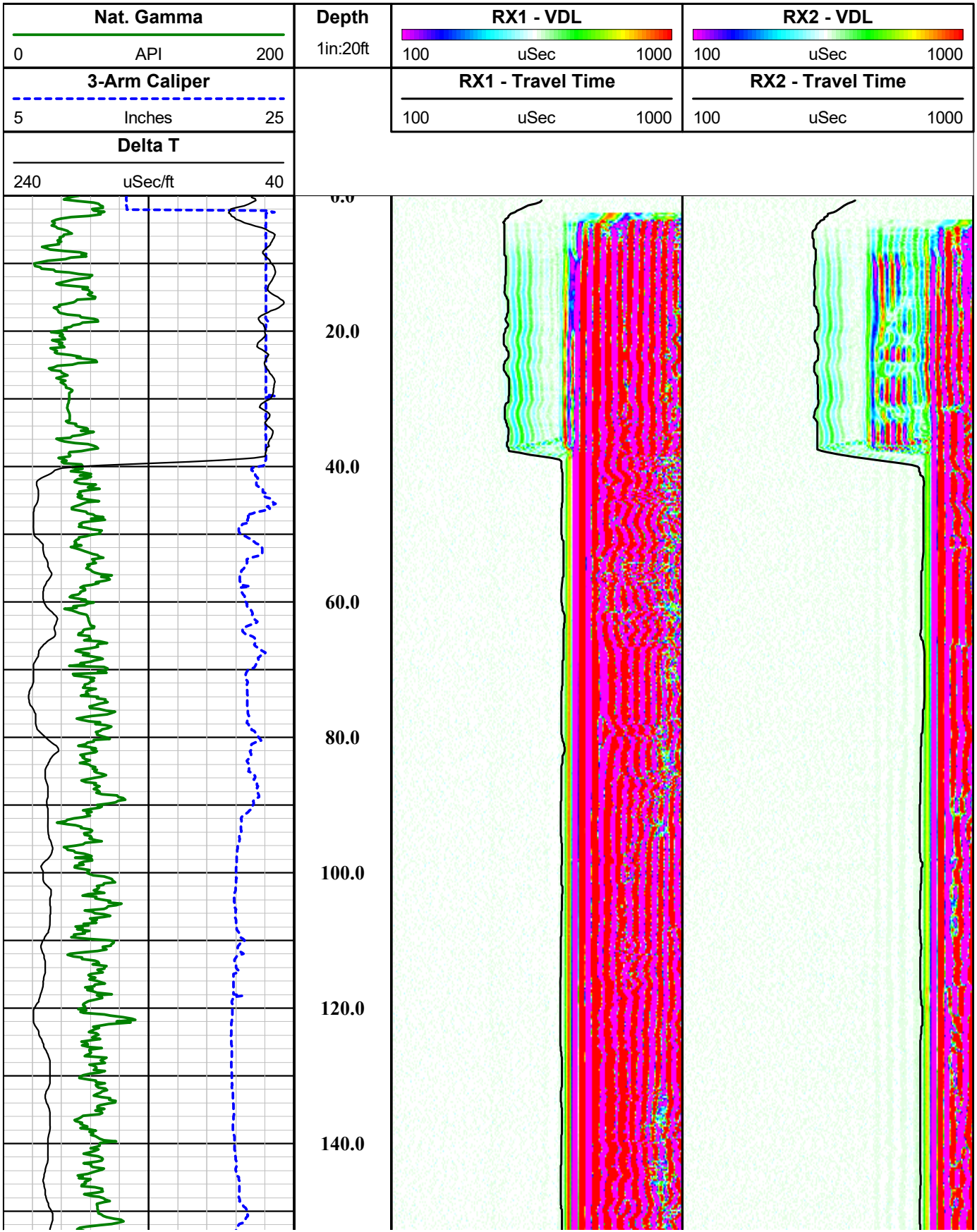

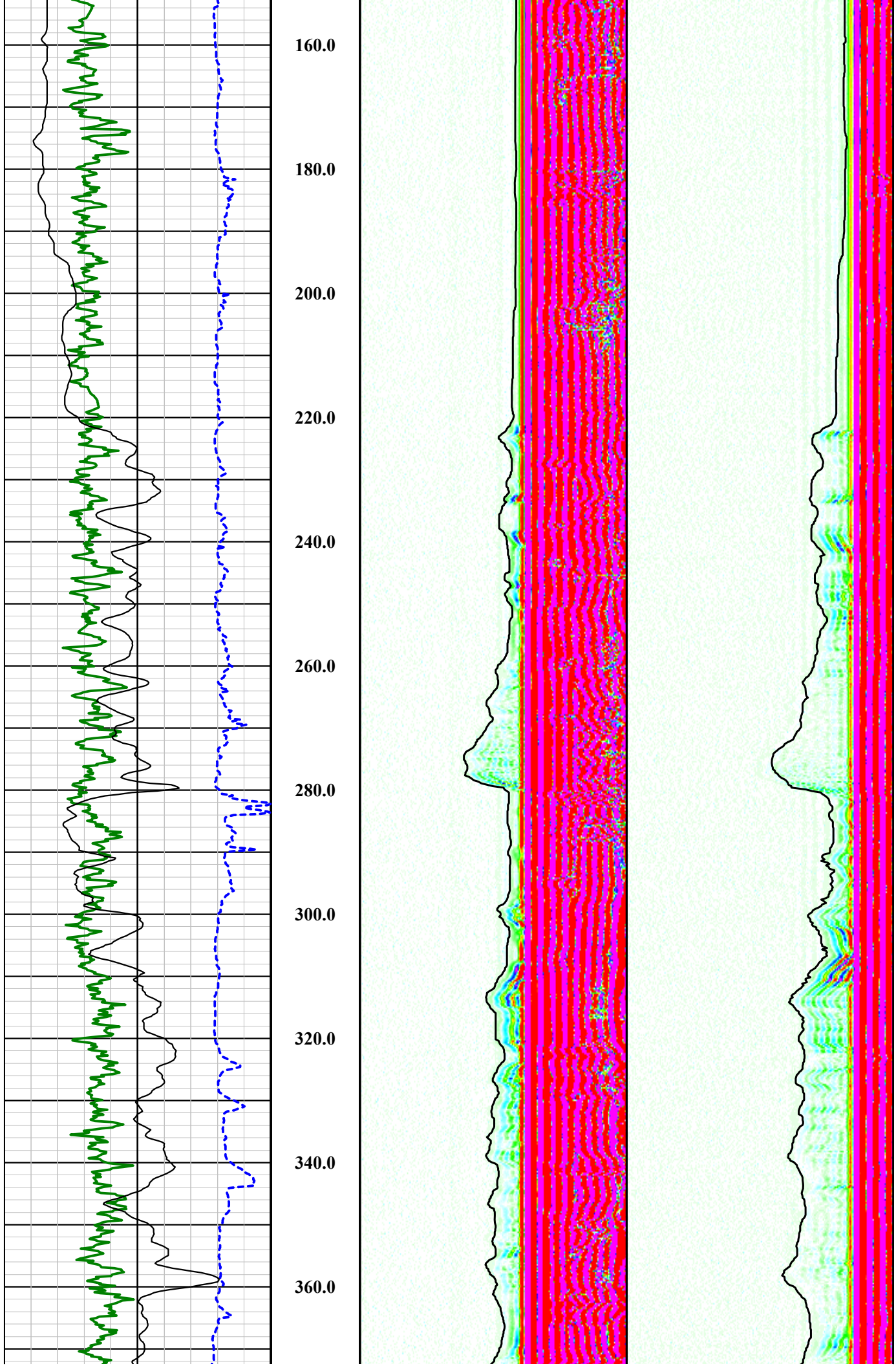
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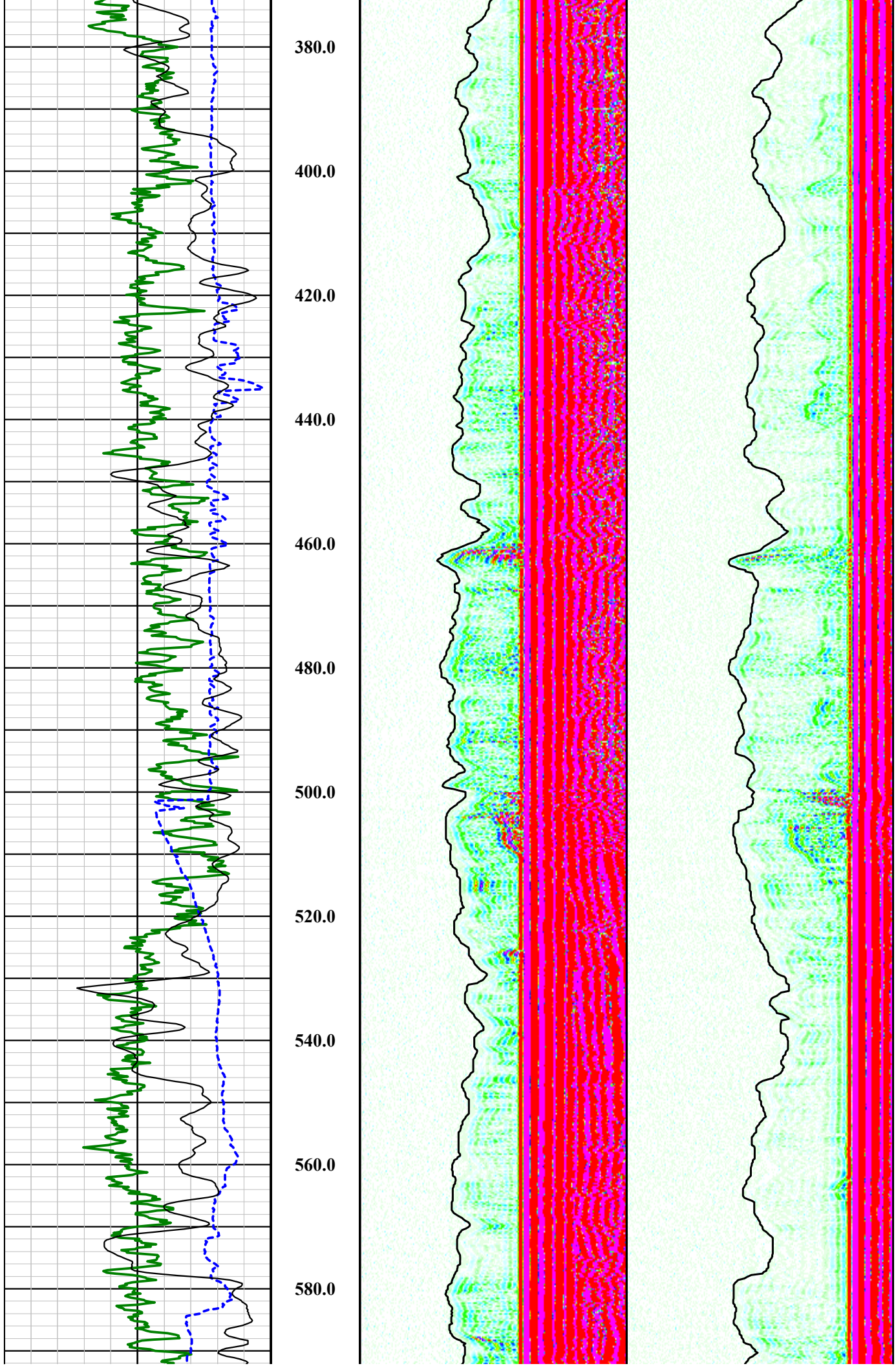
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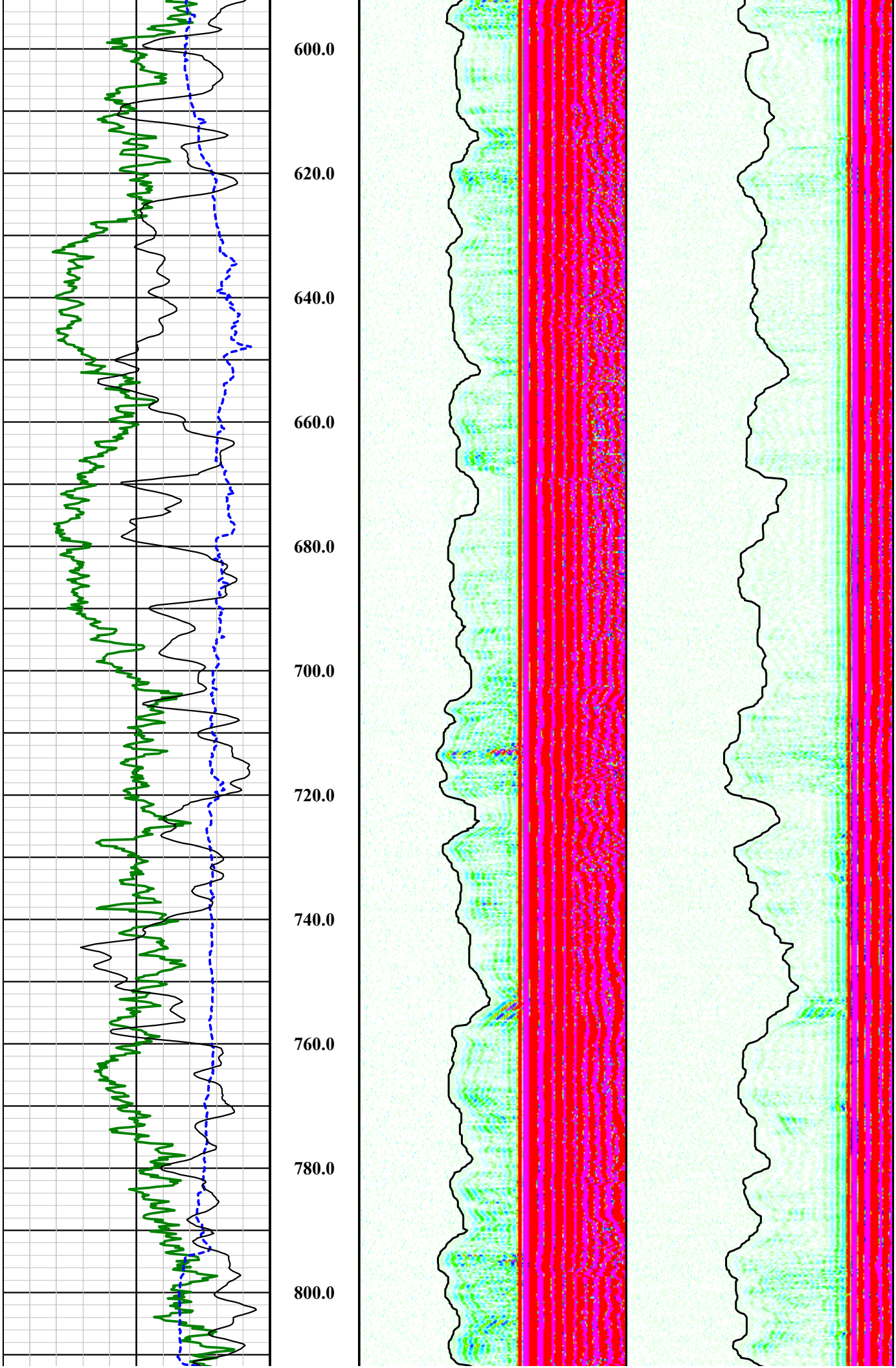
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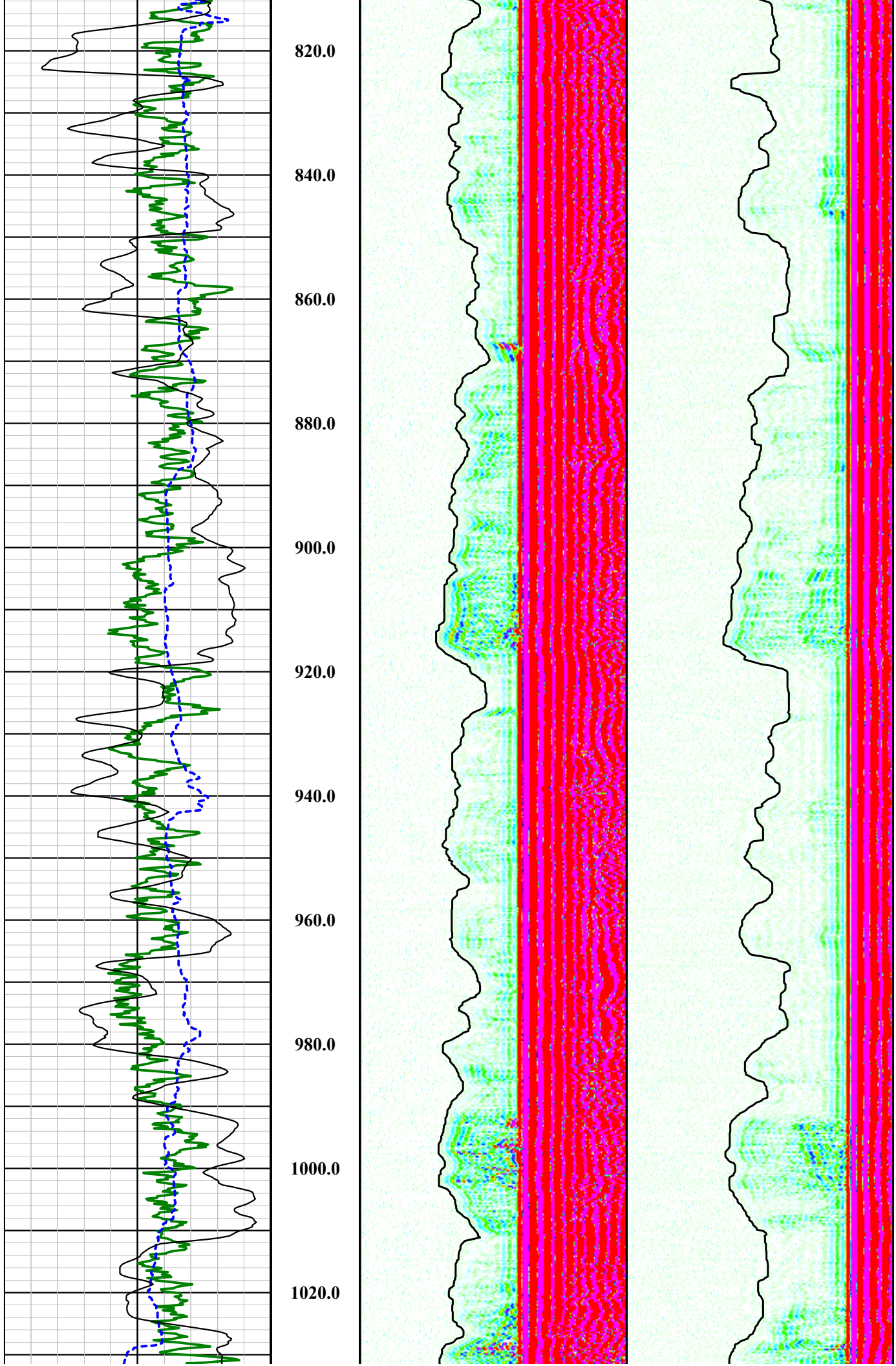
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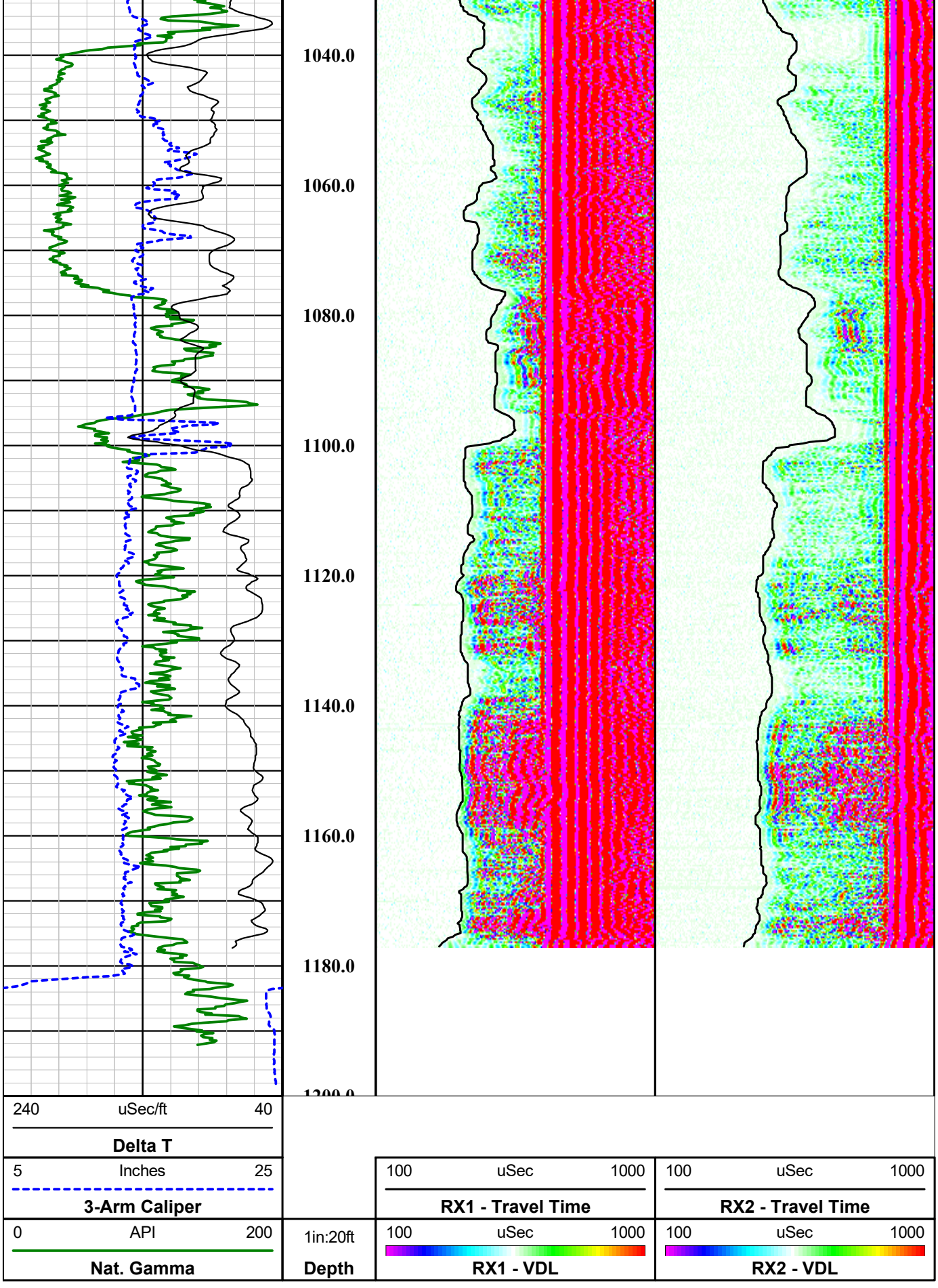


MSI 60 mm 2 RX Full Waveform Sonic Tool

Probe Top = Depth Ref.

Tool SN: 5001, 5050 & 6003

Four Conductor MSI Probe Top

Probe Length = 2.8 m or 9.19 ft
Probe Weight = ~26.5 kg or 58.4 lbs

Sensors: Ceramic Piezoelectric

Transmitter Frequency: 24 - 28 kHz resonant frequency

Rx - Rx Spacing: 0.3 m (12.0 in)

Typically centralized with external centralizers

Can only be collected in fluid

Temperature Rating: 80 Deg C (176 Deg F)
Presure Rating: 200 bar (2900 psi)

Rx-2 Tx - Rx2 Spacing = 1.22 m (48.0 in)

Rx-1 Tx - Rx1 Spacing = .91 m (36.0 in)

Acoustic Isolater

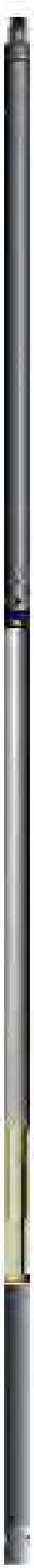
Tx = Acoustic Transmitter

0.660 m or 26.0 in. - End of tool to center of Tx

2.36 in or 60 mm Diameter

MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

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Probe Weight = 6.80 kg or 15.0 lbs

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Presure Rating: 200 bar (2900 psi)

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NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

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Distance from tool top: 2.20 m (86.5 in)

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1.375" or 34.9 mm Diameter

1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	I-01
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final Sonic Summary

Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR

FLORENCE COPPER

I-01

Monday - December 4, 2017

Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC
(480) 926-4558

Company: FLORENCE COPPER **Well Owner:**

County: PINAL **State:** Arizona **Country:** USA

Well Number: I-01 **Survey Date:** Monday - December 4, 2017 **Magnetic Declination:** Declination Correction Not Used

Field: **Drift Calculation Methodology:** Balanced Tangential Method

Location:

Remarks:

Witness: ZACH - H&A **Vehicle No.:** 200 **Invoice No.:** **Operator:** A. OLSON **Well Depth:** 500 Feet **Casing size:** 20 Inches

Tool: Compass - 3082 **Lat.:** **Long.:** **Sec.:** **Twp.:** **Rge.:**

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BGR., degrees
0	0.11	184.69	0.00						
20	0.17	212.53	19.99	-0.044	-0.018	1.00	3.46	0.05' (.60")	201.70
40	0.27	116.24	39.98	-0.090	0.008	0.41	10.70	0.09' (1.08")	174.70
60	0.35	331.23	59.97	-0.057	0.021	0.96	13.70	0.06' (.72")	160.00
80	0.11	000.71	79.96	0.016	-0.008	0.84	3.66	0.02' (.24")	332.60
100	0.27	271.76	99.96	0.037	-0.055	0.42	10.07	0.07' (.84")	303.70
120	0.26	242.80	119.95	0.018	-0.142	0.13	3.59	0.14' (1.68")	277.10
140	0.11	259.75	139.94	-0.006	-0.201	0.43	2.12	0.20' (2.40")	268.20
160	0.09	112.05	159.93	-0.015	-0.205	0.83	13.80	0.21' (2.52")	265.70
180	0.22	220.35	179.92	-0.050	-0.215	0.95	11.65	0.22' (2.64")	256.90
200	0.17	262.41	199.91	-0.083	-0.269	0.37	5.16	0.28' (3.36")	252.80
220	0.14	223.10	219.90	-0.105	-0.315	1.00	4.83	0.33' (3.96")	251.60
240	1.00	274.34	239.89	-0.110	-0.506	1.00	6.21	0.52' (6.24")	257.80
260	0.17	151.07	259.88	-0.123	-0.666	0.34	12.64	0.68' (8.16")	259.60
280	0.06	101.80	279.87	-0.151	-0.641	0.93	5.99	0.66' (7.92")	256.70
300	0.09	114.47	299.86	-0.160	-0.616	0.78	1.59	0.64' (7.68")	255.50
320	0.13	142.09	319.85	-0.184	-0.588	0.53	3.43	0.62' (7.44")	252.60
340	0.35	342.93	339.84	-0.144	-0.592	0.00	14.13	0.61' (7.32")	256.40

True Vertical Depth: 499.76' **Final Drift Distance:** .92' (11.04") **Final Drift Bearing:** 328.80°

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

I-01

(480) 926-4558

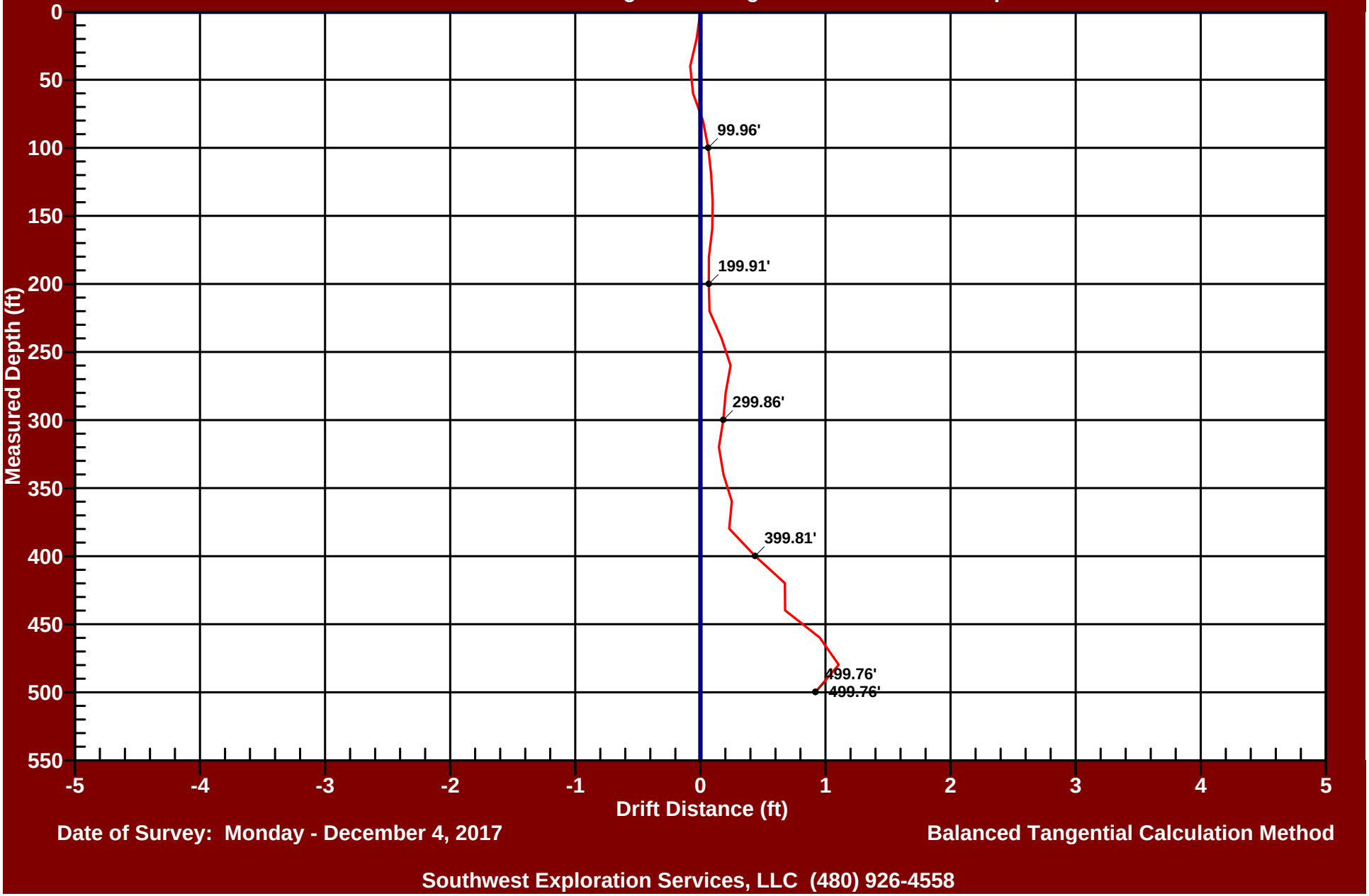
MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees
360	0.11°	256.98°	359.83	-0.090	-0.629	0.56	9.79	0.64' (7.68")	261.90
380	0.21°	199.38°	379.82	-0.129	-0.660	0.73	6.92	0.67' (8.04")	258.90
400	1.50°	356.74°	399.81	0.098	-0.687	0.88	14.09	0.69' (8.28")	278.10
420	0.04°	025.14°	419.80	0.366	-0.699	0.20	3.53	0.79' (9.48")	297.60
440	0.13°	233.09°	439.79	0.359	-0.714	0.97	13.94	0.80' (9.60")	296.70
460	1.64°	313.31°	459.78	0.542	-0.940	0.96	9.26	1.09' (13.08")	299.90
480	0.93°	106.63°	479.77	0.692	-0.993	0.12	13.98	1.21' (14.52")	304.90
500	2.22°	068.23°	499.76	0.789	-0.478	0.81	4.73	0.92' (11.04")	328.80

True Vertical Depth: 499.76' **Final Drift Distance: .92' (11.04")** **Final Drift Bearing: 328.80°**

PLANE OF DRIFT VIEW - I-01

FLORENCE COPPER

Drift Distance = 0.92 Feet Drift Bearing = 328.8 Degrees True Vertical Depth = 499.76 Feet



Date of Survey: Monday - December 4, 2017

Balanced Tangential Calculation Method

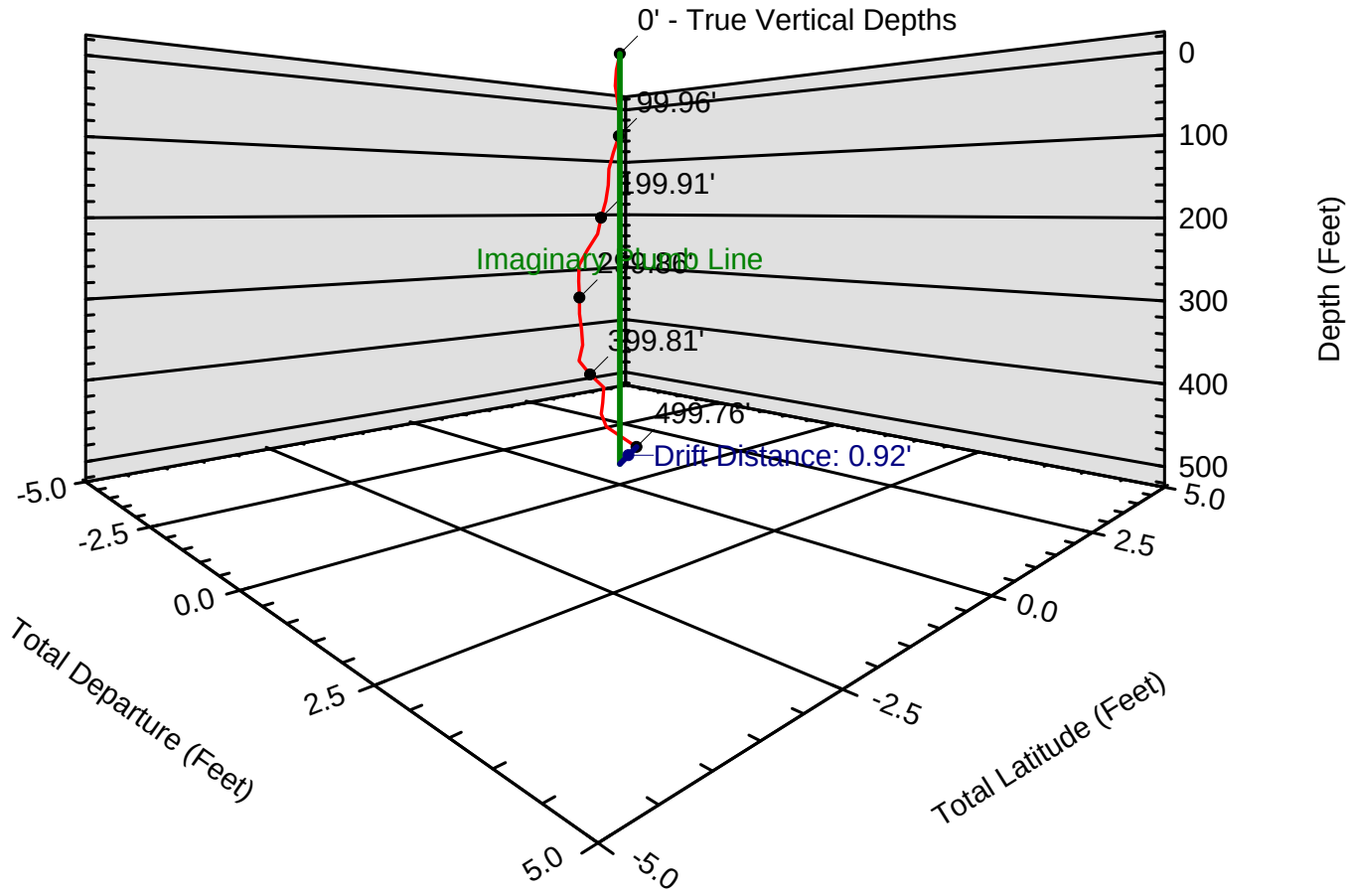
Southwest Exploration Services, LLC (480) 926-4558

3D PROJECTION VIEW - I-01

FLORENCE COPPER

Drift Distance = 0.92 Feet Drift Bearing = 328.8 Degrees True Vertical Depth = 499.76 Feet

226.0



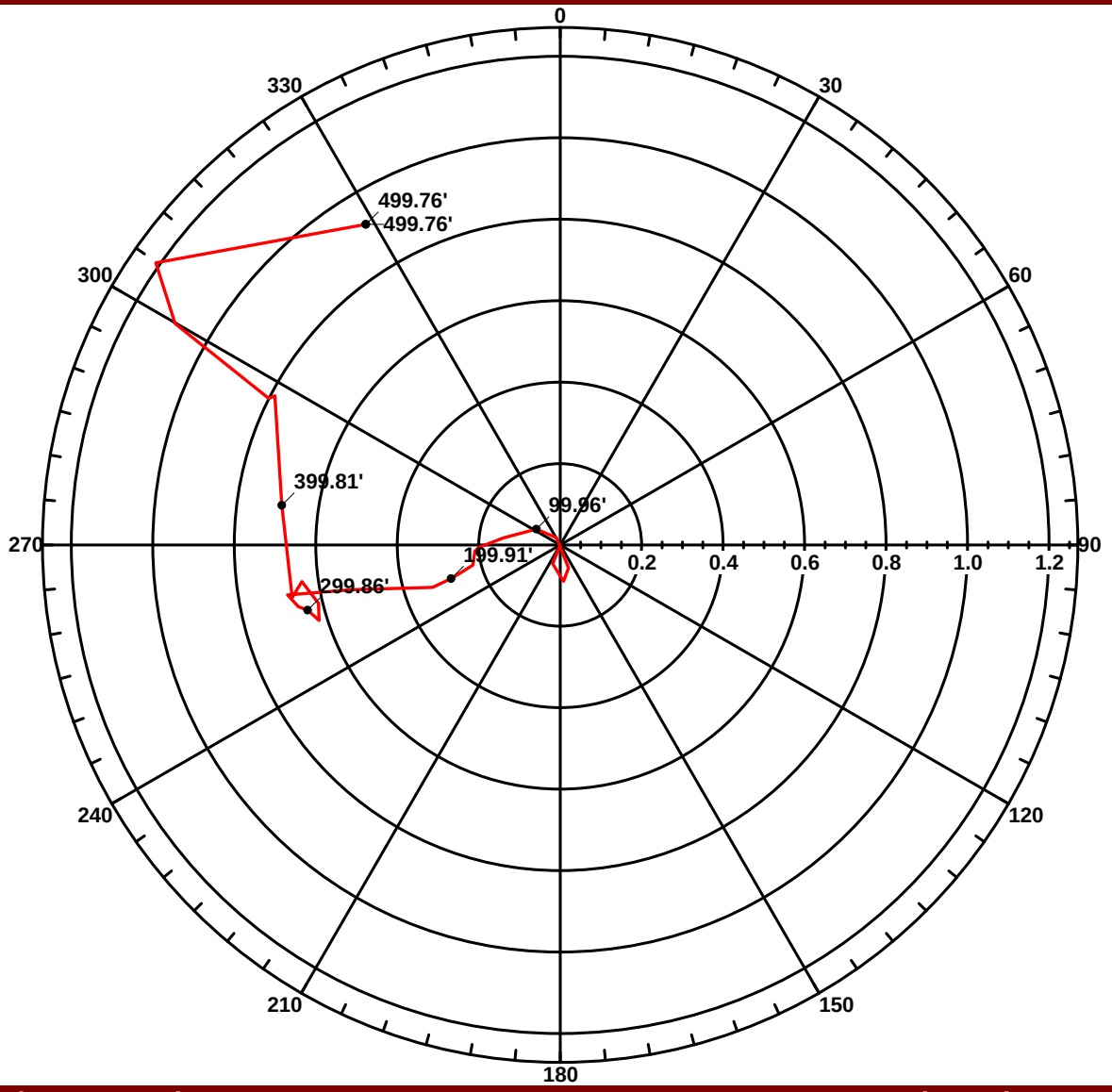
Date of Survey: Monday - December 4, 2017 **Balanced Tangential Calculation Method**

Southwest Exploration Services, LLC (480) 926-4558

POLAR VIEW - I-01

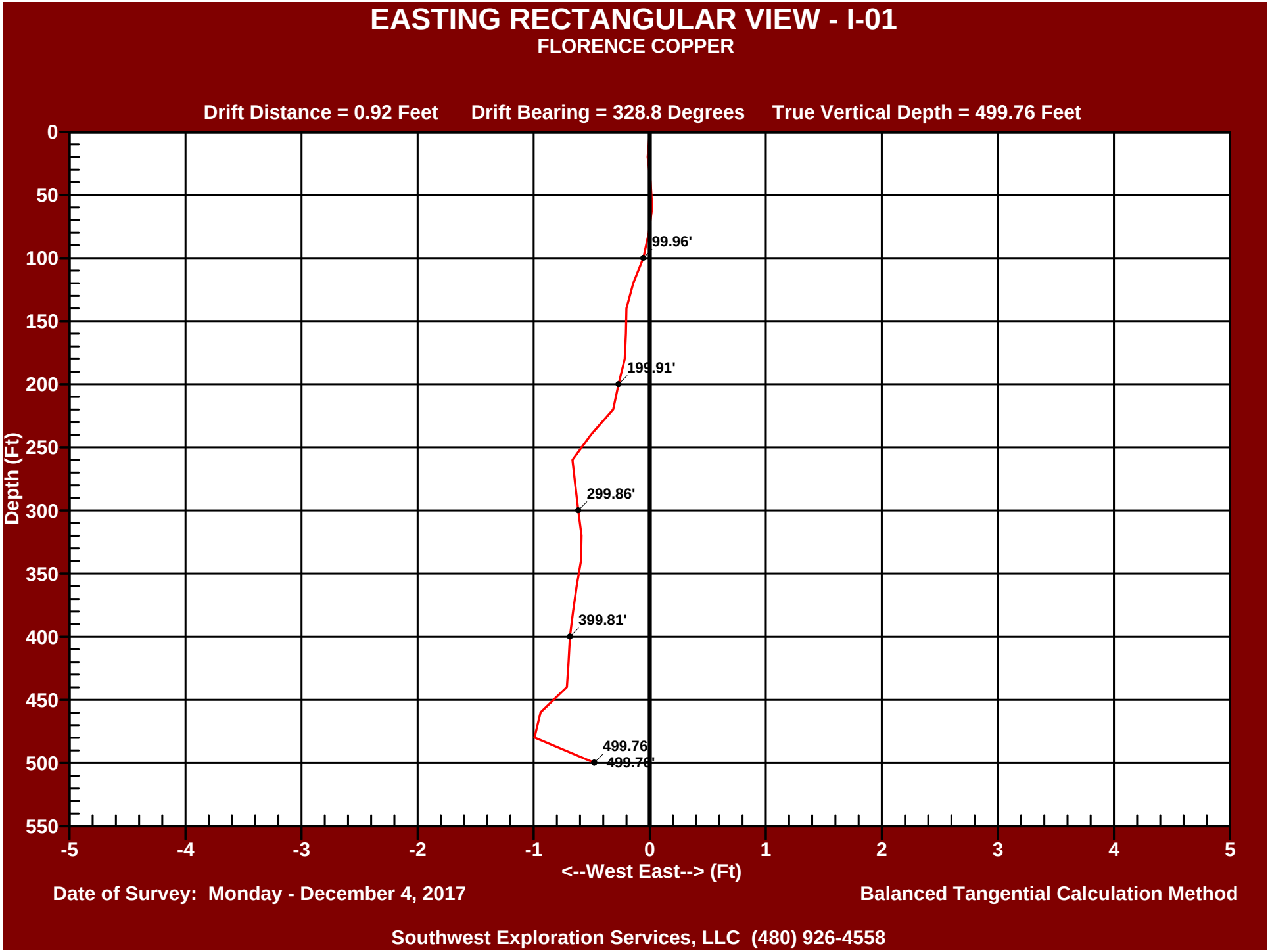
FLORENCE COPPER

Drift Distance = 0.92 Feet Drift Bearing = 328.8 Degrees True Vertical Depth = 499.76 Feet



Date of Survey: Monday - December 4, 2017 **Balanced Tangential Calculation Method**

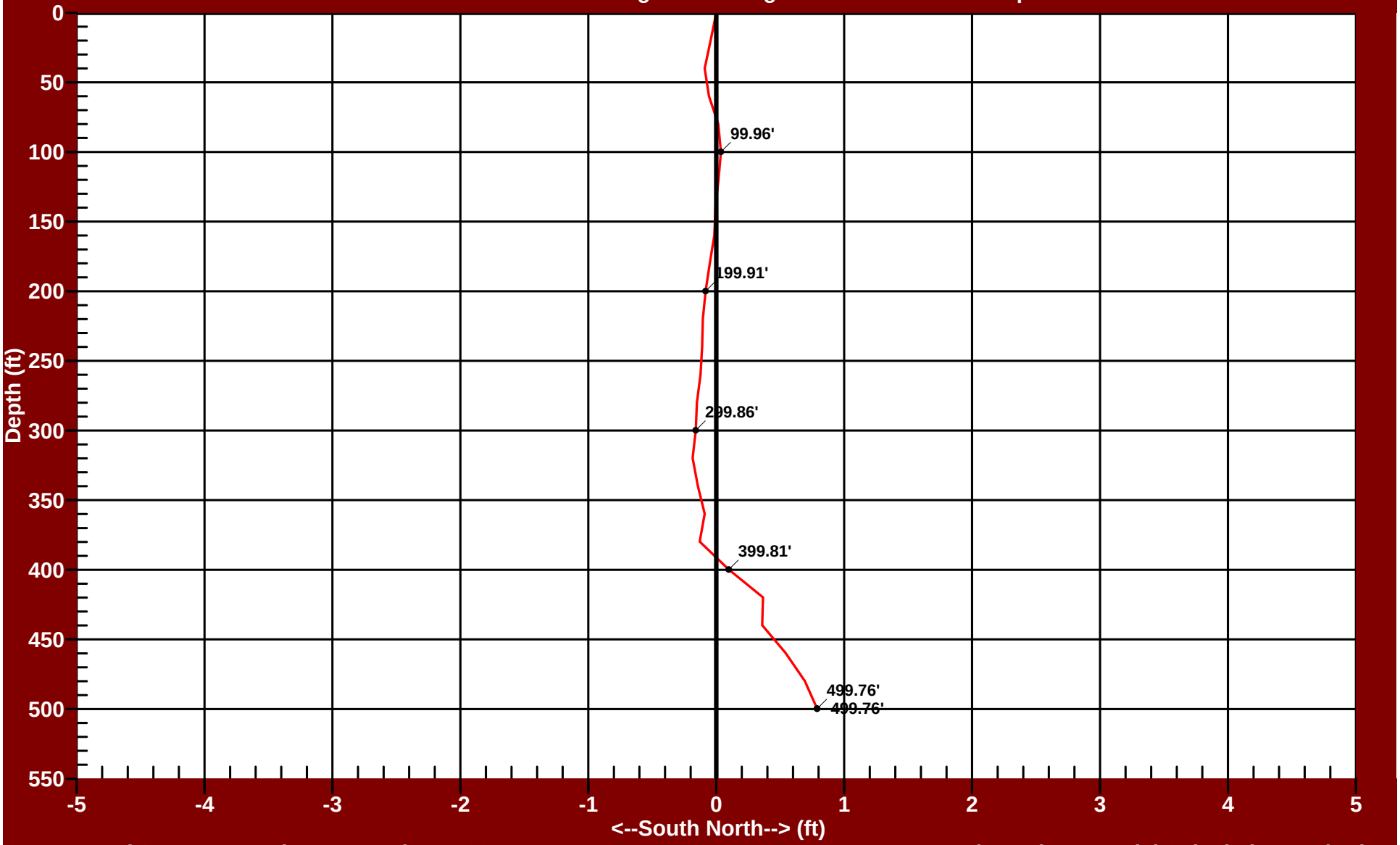
Southwest Exploration Services, LLC (480) 926-4558


EASTING RECTANGULAR VIEW - I-01
FLORENCE COPPER
Drift Distance = 0.92 Feet
Drift Bearing = 328.8 Degrees
True Vertical Depth = 499.76 Feet
Depth (Ft)
0
50
100
150
200
250
300
350
400
450
500
550
99.96'
199.91'
299.86'
399.81'
499.76
499.76'
-5
-4
-3
-2
-1
0
1
2
3
4
5
<--West East--> (Ft)
Date of Survey: Monday - December 4, 2017
Balanced Tangential Calculation Method
Southwest Exploration Services, LLC (480) 926-4558

NORTHING RECTANGULAR VIEW - I-01

FLORENCE COPPER

Drift Distance = 0.92 Feet Drift Bearing = 328.8 Degrees True Vertical Depth = 499.76 Feet



Date of Survey: Monday - December 4, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR

FLORENCE COPPER

I-01

Monday - March 5, 2018

Southwest Exploration Services, LLC
borehole geophysics and video services

Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

Company: FLORENCE COPPER **Well Owner:**

County: PINAL **State:** Arizona **Country:** United States

Well Number: I-01 **Survey Date:** Monday - March 5, 2018 **Magnetic Declination:** Declination Correction Not Used

Field: FLORENE COPPER **Drift Calculation Methodology:** Balanced Tangential Method

Location:

Remarks:

Witness: HALEY & ALDRICH **Vehicle No.:** 900 **Invoice No.:** **Operator:** M. QUINONES **Well Depth:** 1174 Feet **Casing size:** 5 Inches

Tool: Compass - 6002 **Lat.:** **Long.:** **Sec.:** **Twp.:** **Rge.:**

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BGR., degrees
500	1.23	149.60	500.00						
520	1.37	077.66	519.99	-0.134	0.342	0.95	9.05	0.37' (4.44")	111.40
540	1.60	077.45	539.98	-0.022	0.848	0.18	0.04	0.85' (10.20")	091.50
560	1.98	074.02	559.97	0.134	1.453	0.37	0.46	1.46' (17.52")	084.70
580	1.20	064.74	579.96	0.318	1.975	0.20	1.25	2.00' (24.00")	080.80
600	1.40	072.06	599.95	0.483	2.397	0.94	0.98	2.44' (29.28")	078.60
620	1.01	072.21	619.94	0.612	2.797	1.00	0.06	2.86' (34.32")	077.70
640	1.82	079.71	639.93	0.723	3.277	0.58	1.01	3.36' (40.32")	077.60
660	1.27	072.62	659.92	0.846	3.801	0.98	0.96	3.89' (46.68")	077.50
680	1.74	078.14	679.91	0.975	4.310	0.99	0.74	4.42' (53.04")	077.30
700	1.57	066.46	699.90	1.147	4.858	0.55	1.57	4.99' (59.88")	076.70
720	1.20	070.29	719.89	1.327	5.306	0.99	0.52	5.47' (65.64")	076.00
740	1.83	070.90	739.88	1.502	5.805	0.90	0.12	6.00' (72.00")	075.50
760	1.51	080.41	759.87	1.650	6.367	0.32	1.28	6.58' (78.96")	075.50
780	1.70	072.42	779.86	1.784	6.910	0.22	1.07	7.14' (85.68")	075.50
800	1.59	086.77	799.85	1.889	7.470	0.36	1.93	7.71' (92.52")	075.80
820	2.76	058.33	819.83	2.157	8.157	0.85	3.79	8.44' (101.28")	075.20
840	1.61	081.36	839.81	2.452	8.845	0.94	3.08	9.18' (110.16")	074.50

True Vertical Depth: 1173.63' **Final Drift Distance:** 16.52' (198.24") **Final Drift Bearing:** 83.10°

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

I-01

(480) 926-4558

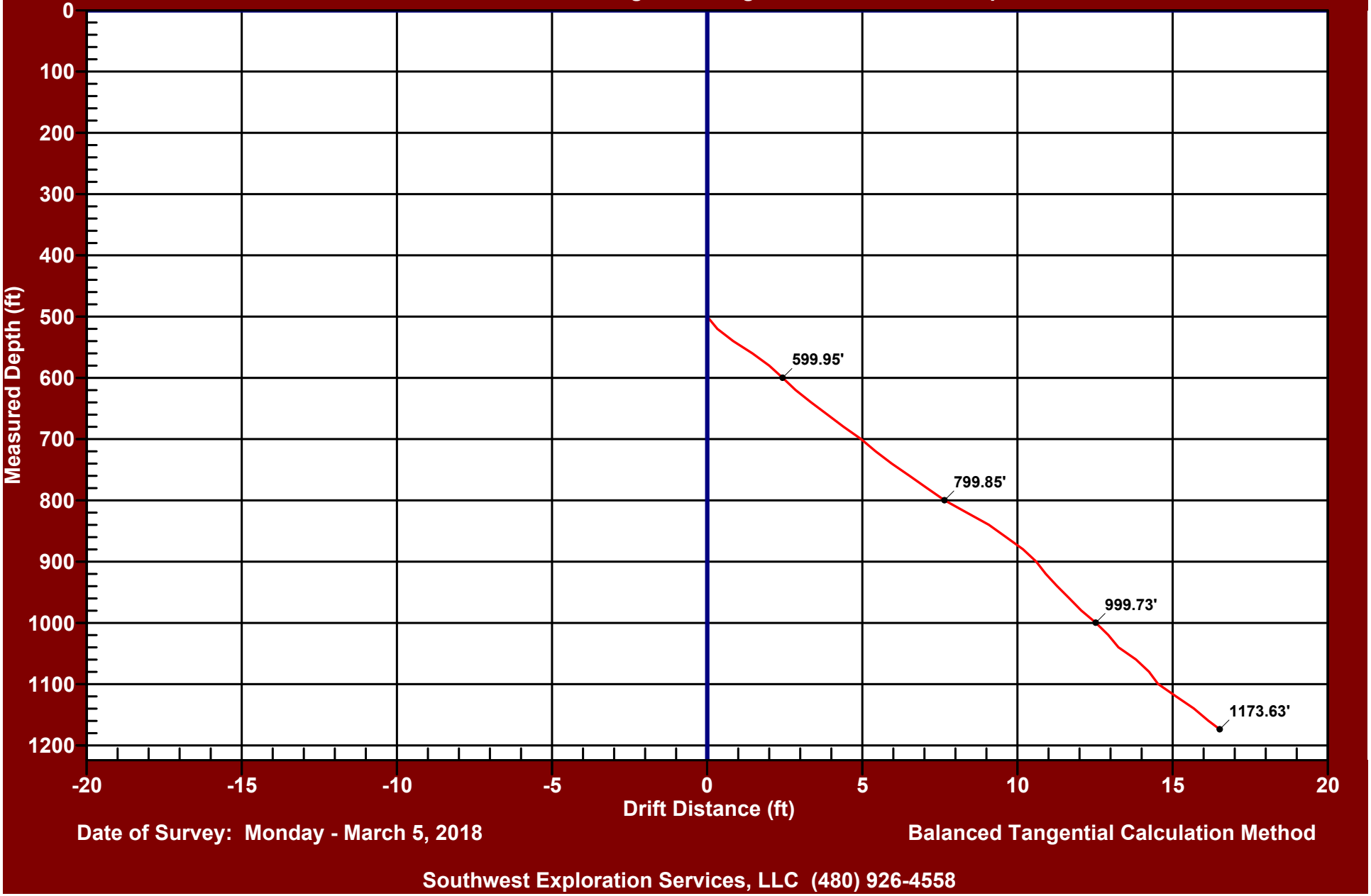
MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees
860	1.59°	076.38°	859.80	2.560	9.392	0.32	0.67	9.73' (116.76")	074.80
880	1.52°	080.98°	879.79	2.667	9.924	0.99	0.62	10.28' (123.36")	075.00
900	0.92°	089.23°	899.78	2.711	10.347	0.99	1.11	10.70' (128.40")	075.30
920	0.89°	095.16°	919.77	2.699	10.662	0.24	0.80	11.00' (132.00")	075.80
940	1.26°	096.49°	939.76	2.660	11.035	0.87	0.19	11.35' (136.20")	076.40
960	1.00°	093.70°	959.75	2.624	11.428	0.68	0.38	11.73' (140.76")	077.10
980	1.51°	115.48°	979.74	2.499	11.840	0.66	2.91	12.10' (145.20")	078.10
1,000	1.53°	107.06°	999.73	2.307	12.333	0.18	1.13	12.55' (150.60")	079.40
1,020	1.02°	111.57°	1,019.72	2.163	12.754	0.71	0.61	12.94' (155.28")	080.40
1,040	1.02°	098.41°	1,039.71	2.072	13.096	0.56	1.77	13.26' (159.12")	081.00
1,060	2.42°	104.17°	1,059.69	1.943	13.681	0.73	0.80	13.82' (165.84")	081.90
1,080	0.23°	038.22°	1,079.68	1.871	14.115	0.10	8.39	14.24' (170.88")	082.40
1,100	1.51°	074.30°	1,099.67	1.974	14.394	0.84	4.78	14.53' (174.36")	082.20
1,120	1.81°	085.80°	1,119.66	2.068	14.963	0.81	1.54	15.10' (181.20")	082.10
1,140	1.50°	095.55°	1,139.65	2.066	15.539	0.23	1.31	15.68' (188.16")	082.40
1,160	1.35°	104.32°	1,159.64	1.982	16.028	0.54	1.18	16.15' (193.80")	082.90
1,174	1.76°	081.75°	1,173.63	1.972	16.401	0.62	4.31	16.52' (198.24")	083.10

Page No. 2 **True Vertical Depth: 1173.63'** **Final Drift Distance: 16.52' (198.24")** **Final Drift Bearing: 83.10°**

PLANE OF DRIFT VIEW - I-01

FLORENCE COPPER

Drift Distance = 16.52 Feet Drift Bearing = 83.1 Degrees True Vertical Depth = 1173.63 Feet



Date of Survey: Monday - March 5, 2018

Balanced Tangential Calculation Method

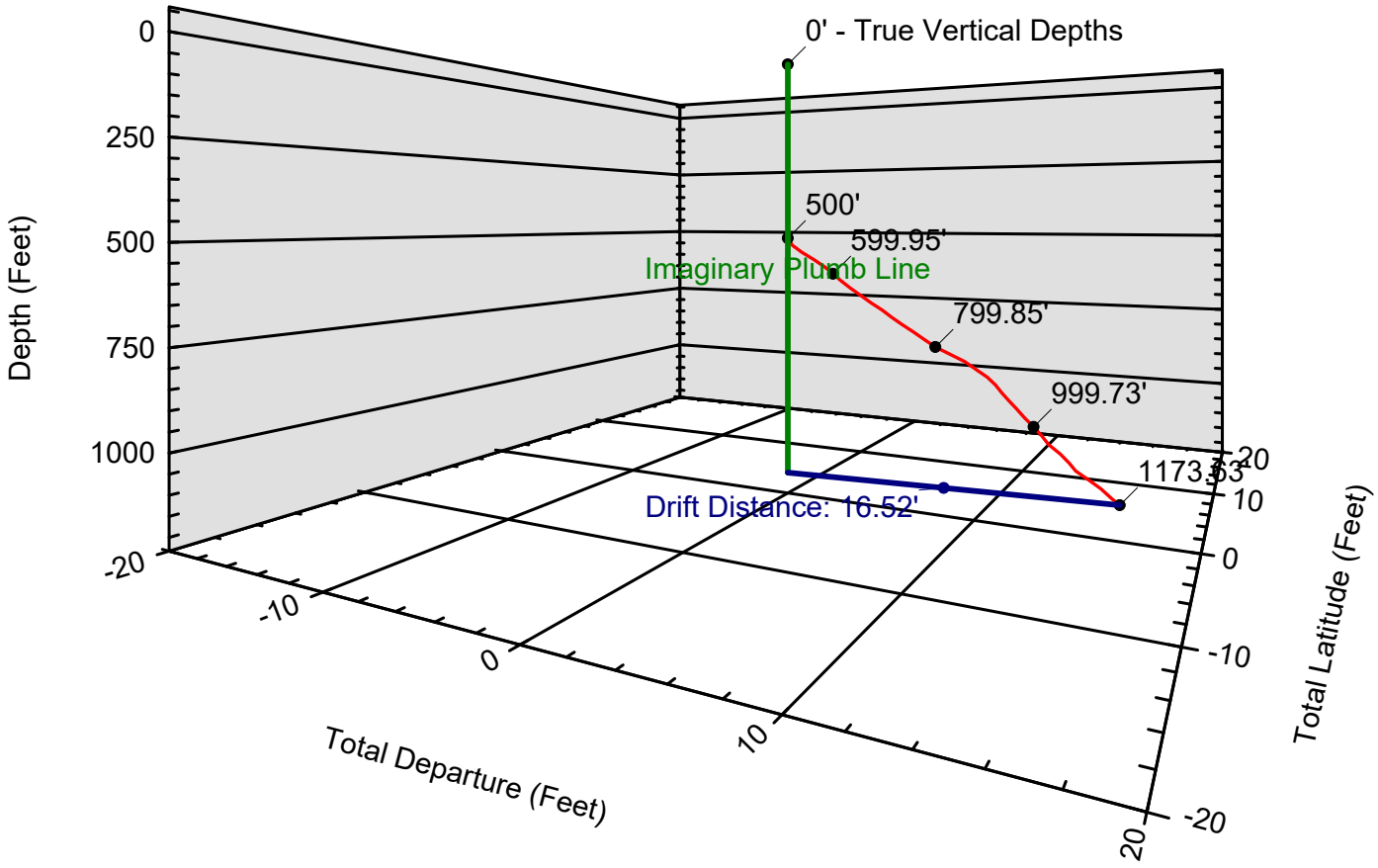
Southwest Exploration Services, LLC (480) 926-4558

3D PROJECTION VIEW - I-01

FLORENCE COPPER

Drift Distance = 16.52 Feet Drift Bearing = 83.1 Degrees True Vertical Depth = 1173.63 Feet

207.0



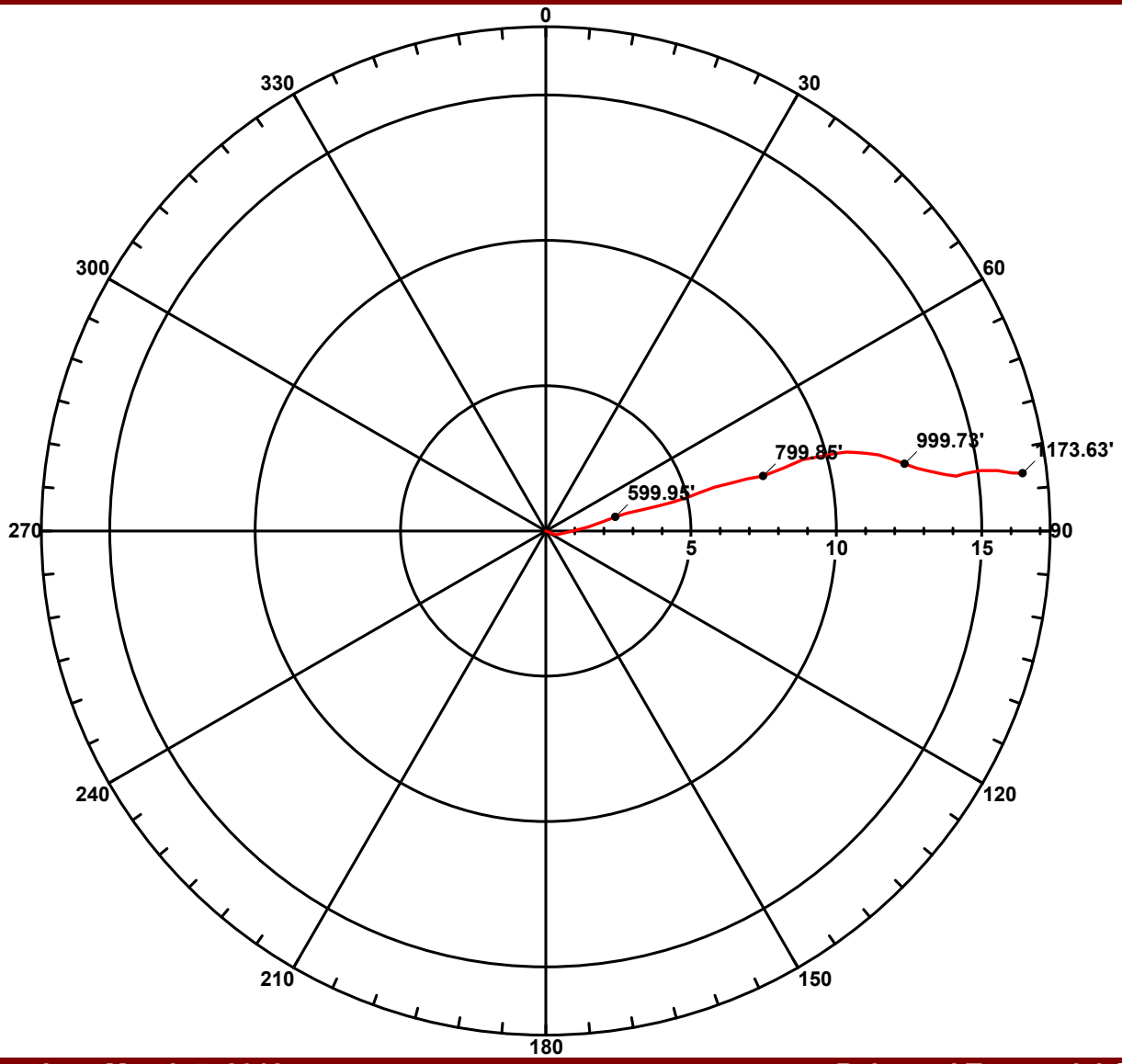
Date of Survey: Monday - March 5, 2018 **Balanced Tangential Calculation Method**

Southwest Exploration Services, LLC (480) 926-4558

POLAR VIEW - I-01

FLORENCE COPPER

Drift Distance = 16.52 Feet Drift Bearing = 83.1 Degrees True Vertical Depth = 1173.63 Feet



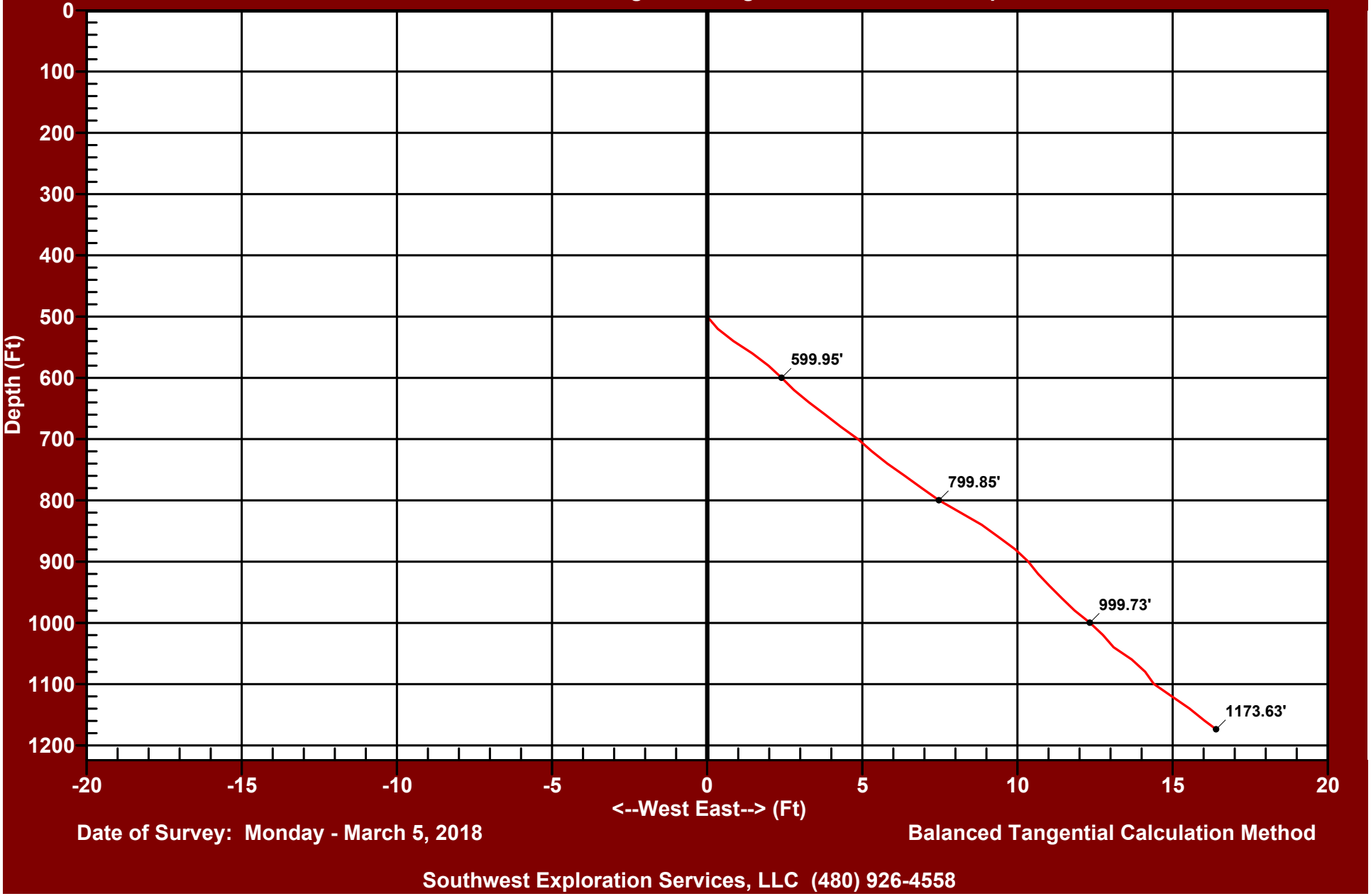
Date of Survey: Monday - March 5, 2018 **Balanced Tangential Calculation Method**

Southwest Exploration Services, LLC (480) 926-4558

EASTING RECTANGULAR VIEW - I-01

FLORENCE COPPER

Drift Distance = 16.52 Feet Drift Bearing = 83.1 Degrees True Vertical Depth = 1173.63 Feet



Date of Survey: Monday - March 5, 2018

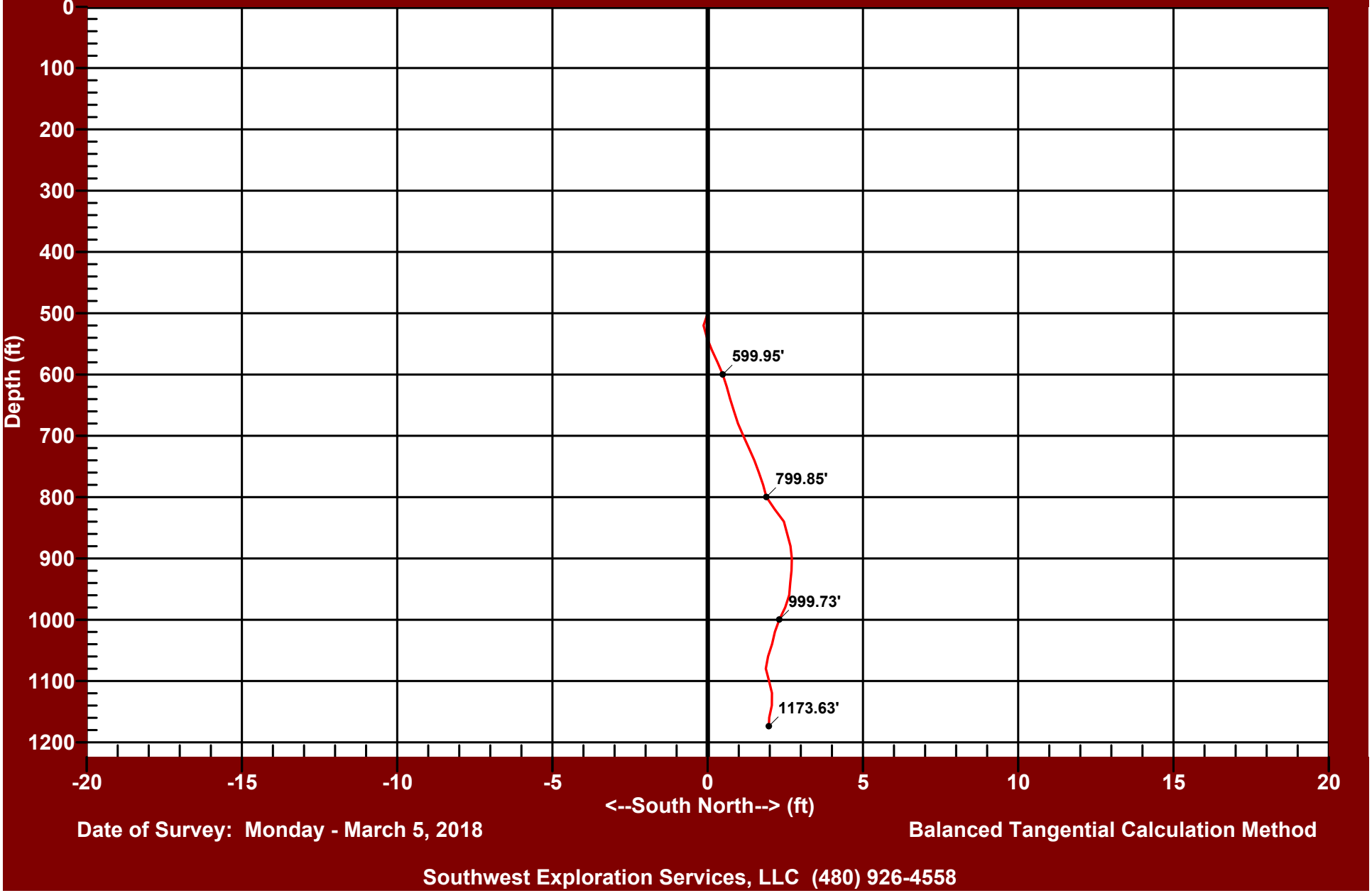
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

NORTHING RECTANGULAR VIEW - I-01

FLORENCE COPPER

Drift Distance = 16.52 Feet Drift Bearing = 83.1 Degrees True Vertical Depth = 1173.63 Feet



Date of Survey: Monday - March 5, 2018

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER
WELL ID	I-01
FIELD	FLORENCE COPPER
COUNTY	PINAL
STATE	ARIZONA

TYPE OF LOGS: 3-ARM CALIPER
MORE: W / VOLUME CALC.

LOCATION

SEC TWP RGE

OTHER SERVICES
E-LOG
SONIC
NEUTRON
DEVIATION
NAT. GAMMA
TEMPERATURE
FLUID RESISTIVITY

PERMANENT DATUM	ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL	G.L.

DATE	12-3-17	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	VOLUME CALCULATION	VISCOSITY	N/A
DEPTH-DRILLER	506 FT.	LEVEL	FULL
DEPTH-LOGGER	502 FT.	MAX. REC. TEMP.	26.71 DEG. C
BTM LOGGED INTERVAL	502 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT.
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #200
RECORDED BY / Logging Eng.	A. OLSON / M. QUINONES	TOOL STRING/SN	MSI COMBO TOOL SN 5543
WITNESSED BY	CHAD - H&A	LOG TIME:ON SITE/OFF SITE	6:00 P.M.

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT.	24 IN.	STEEL	SURFACE	40 FT.
2	20 IN.	40 FT.	TOTAL DEPTH				
3							

COMMENTS:

.

Tool Summary:

Date	12-3-17 / 12-4-17	**Date**	12-3-17	**Date**	12-3-17
Run No.	1	**Run No.**	2	**Run No.**	3
Tool Model	MSI COMBO TOOL	**Tool Model**	MSI E-LOG 40GRP	**Tool Model**	MSI 60MM SONIC
Tool SN	5543	**Tool SN**	5019	**Tool SN**	5050
From	SURFACE	**From**	SURFACE	**From**	SURFACE
To	502 FT.	**To**	502 FT.	**To**	502 FT.
Recorded By	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**	A. OLSON
Truck No	200	**Truck No**	200	**Truck No**	200
Operation Check	12-3-17	**Operation Check**	12-3-17	**Operation Check**	12-3-17
Calibration Check	12-3-17	**Calibration Check**	12-3-17	**Calibration Check**	N/A
Time Logged	6:05 P.M.	**Time Logged**	6:30 P.M.	**Time Logged**	6:50 P.M.

Date	12-3-17 / 12-4-17	**Date**	12-3-17	**Date**	
Run No.	4	**Run No.**	5	**Run No.**	6
Tool Model	MSI DEVIATION	**Tool Model**	COMPROBE GN	**Tool Model**	
Tool SN	3082	**Tool SN**	1107	**Tool SN**	
From	SURFACE	**From**	SURFACE	**From**	
To	502 FT.	**To**	502 FT.	**To**	
Recorded By	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**	
Truck No	200	**Truck No**	200	**Truck No**	
Operation Check	12-3-17	**Operation Check**	12-3-17	**Operation Check**	
Calibration Check	N/A	**Calibration Check**	N/A	**Calibration Check**	
Time Logged	7:25 P.M.	**Time Logged**	7:50 P.M.	**Time Logged**	

Additional Comments:

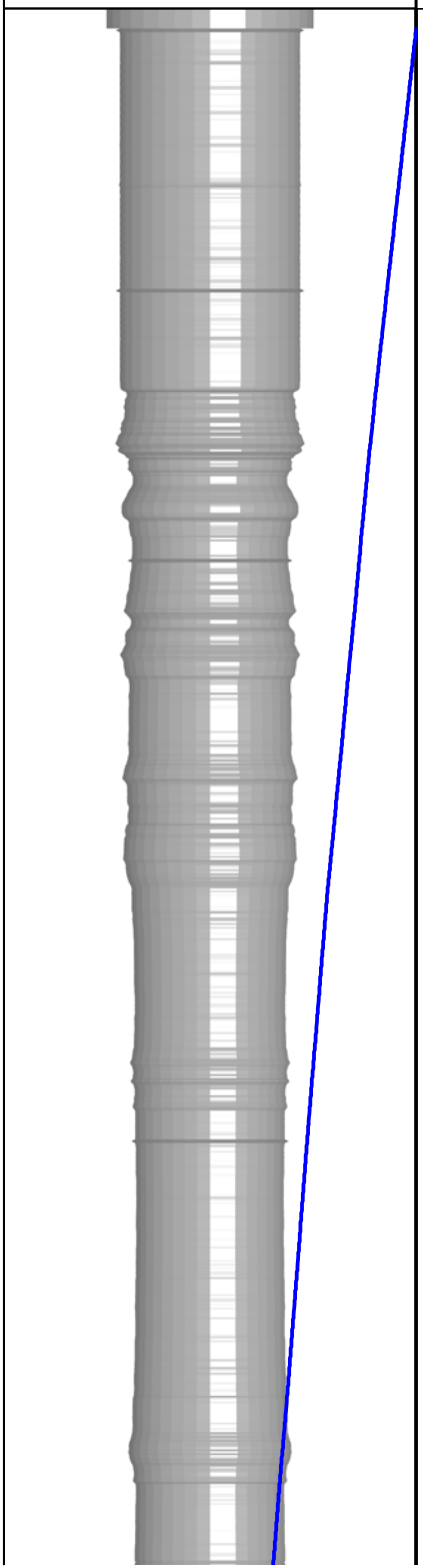
Caliper Arms Used: 15 IN. **Calibration Points:** 8 IN. & 23 IN.

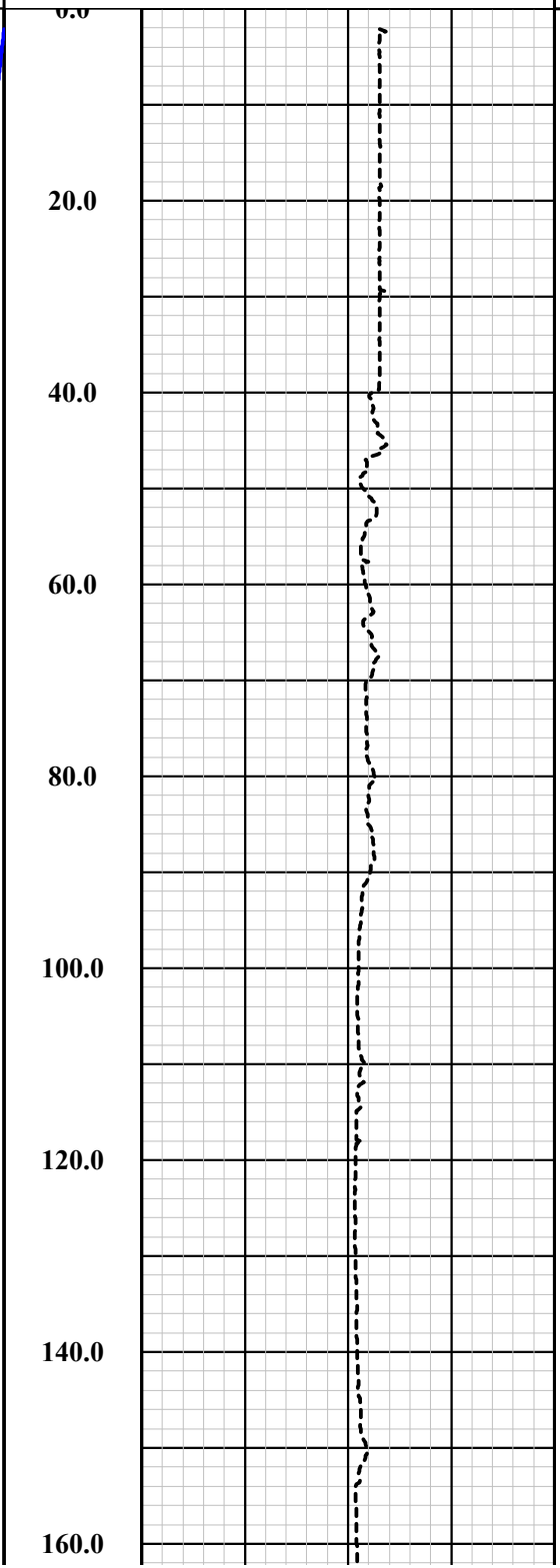
E-Log Calibration Range: 1-1000 OHM-M **Calibration Points:** 1 & 1000 OHM-M

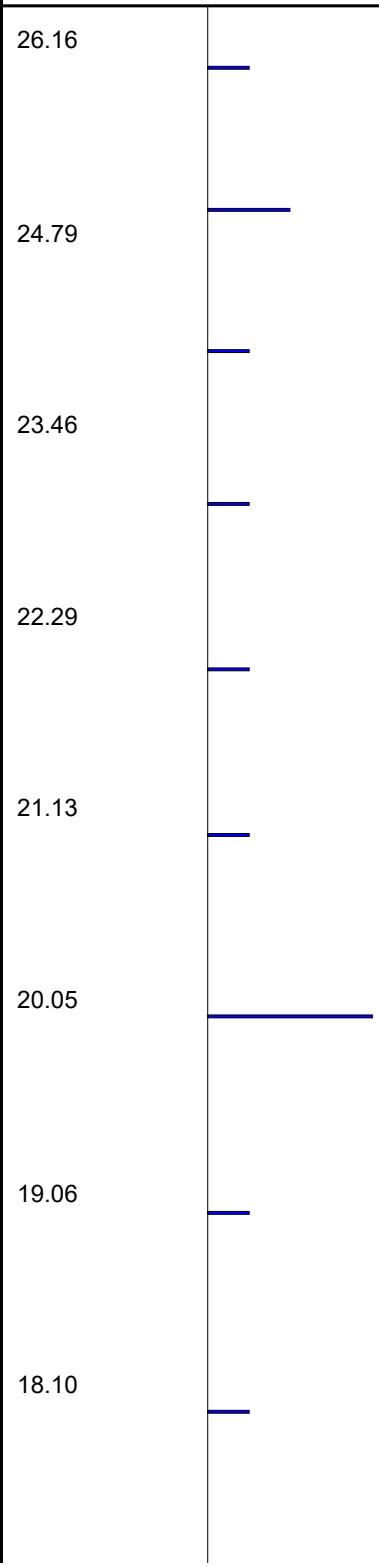
Disclaimer:

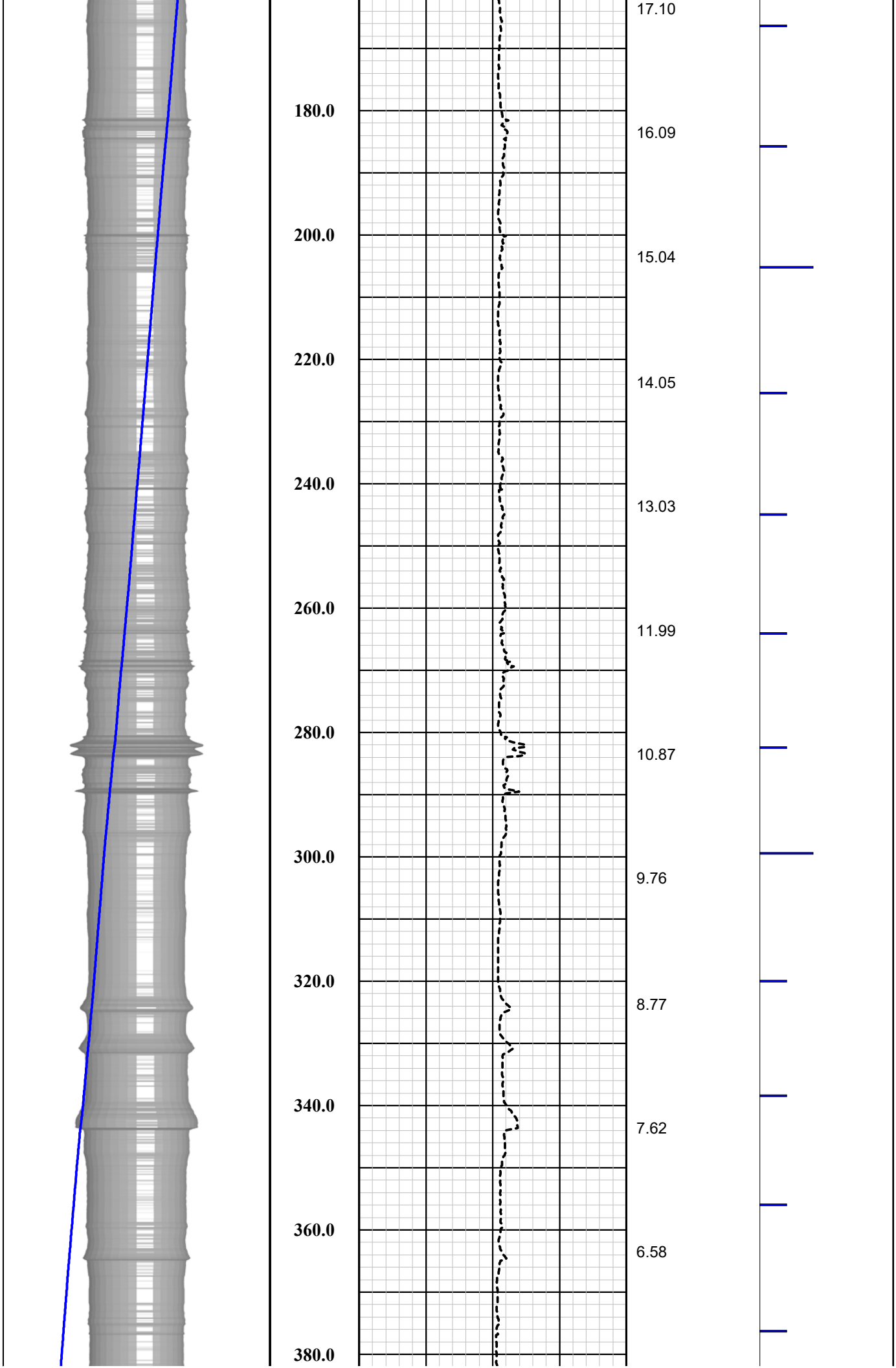
All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

Total Volume	Depth	3-Arm Caliper	Cumulated Volume (cu.yd)
0 cu.yd 26.26	1in:20ft	0 Inches 40	
3-D View			Based on 14" OD Casing
-0°			





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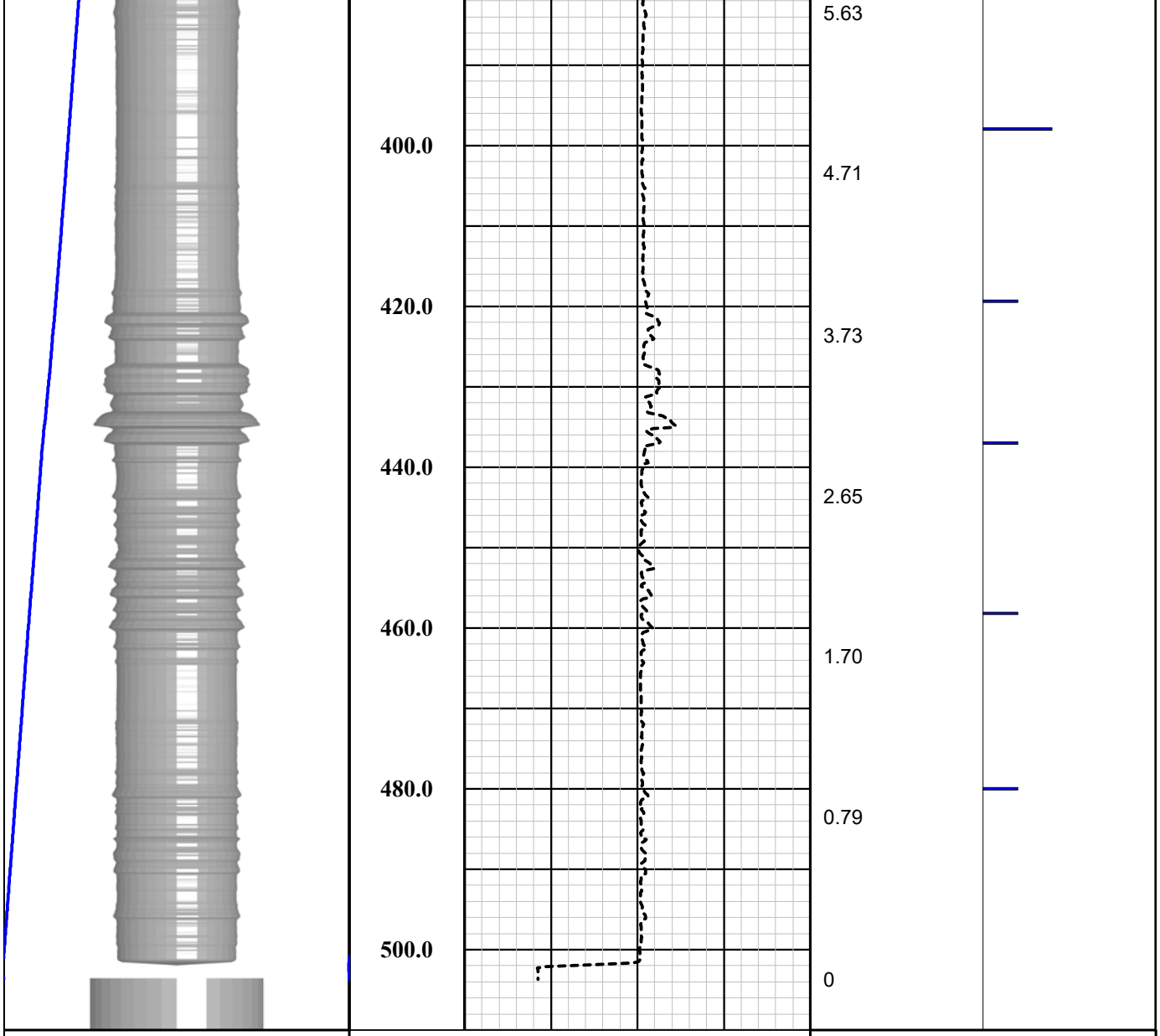
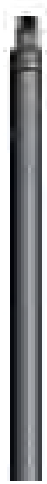
6.58



MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



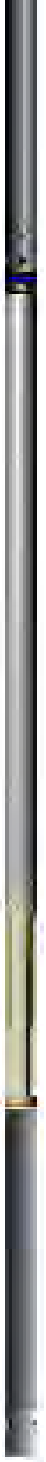
Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)



Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	I-01
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final Caliper w / Volume Calculation Summary

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY FLORENCE COPPER
WELL ID I-01
FIELD FLORENCE COPPER
COUNTY PINAL STATE ARIZONA

TYPE OF LOGS: VOLUME CALC.
MORE: BASED ON 5.5" CASING

LOCATION

SEC TWP RGE

OTHER SERVICES
TEMPERATURE
FLUID RESISTIVITY
E-LOG
SONIC
DEVIATION
GAMMA-NEUTRON

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL		G.L.

DATE	3-5-18	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	VOLUME CALCULATION	VISCOSITY	N/A
DEPTH-DRILLER	1220 FT	LEVEL	FULL
DEPTH-LOGGER	1183 FT	MAX. REC. TEMP.	23.84 Deg C
BTM LOGGED INTERVAL	1183 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	500 FT	SAMPLE INTERVAL	0.2 FT.
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	M. QUINONES / A. OLSON	TOOL STRING/SN	MSI COMBO TOOL SN 4183
WITNESSED BY	CHAD - H&A	LOG TIME:ON SITE/OFF SITE	5:15 PM

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT	24"	STEEL	SURFACE	40 FT
2	20"	40 FT	500 FT	14"	STEEL	SURFACE	500 FT
3	12 1/4"	500 FT	TOTAL DEPTH				

COMMENTS:

.

Tool Summary:

Date	3-5-18	**Date**	3-5-18	**Date**	3-5-18	**Date**	3-5-18
Run No.	1	**Run No.**	2	**Run No.**	4	**Run No.**	3
Tool Model	MSI COMBO TOOL	**Tool Model**	GEOVISTA E-LOG	**Tool Model**	MSI 60MM SONIC	**Tool Model**	COMPROBE GN
Tool SN	5543	**Tool SN**	4035	**Tool SN**	5050	**Tool SN**	1107
From	500 FT	**From**	500 FT	**From**	500 FT	**From**	500 FT
To	1183 FT	**To**	1183 FT	**To**	1183 FT	**To**	1183 FT
Recorded By	M. QUINONES	**Recorded By**	M. QUINONES	**Recorded By**	M. QUINONES	**Recorded By**	M. QUINONES
Truck No	900	**Truck No**	900	**Truck No**	900	**Truck No**	900
Operation Check	3-5-18	**Operation Check**	3-5-18	**Operation Check**	3-5-18	**Operation Check**	3-5-18
Calibration Check	3-5-18	**Calibration Check**	3-5-18	**Calibration Check**	N/A	**Calibration Check**	3-5-18
Time Logged	5:50 PM	**Time Logged**	6:45 PM	**Time Logged**	8:10 PM	**Time Logged**	7:15 PM

Date	3-5-18		
Run No.	5		6
Tool Model	MSI DEVIATION		
Tool SN	6002		
From	500 FT		
To	1183 FT		
Recorded By	M. QUINONES		
Truck No	900		
Operation Check	3-5-18		
Calibration Check	N/A		
Time Logged	9:40 PM		

Additional Comments:

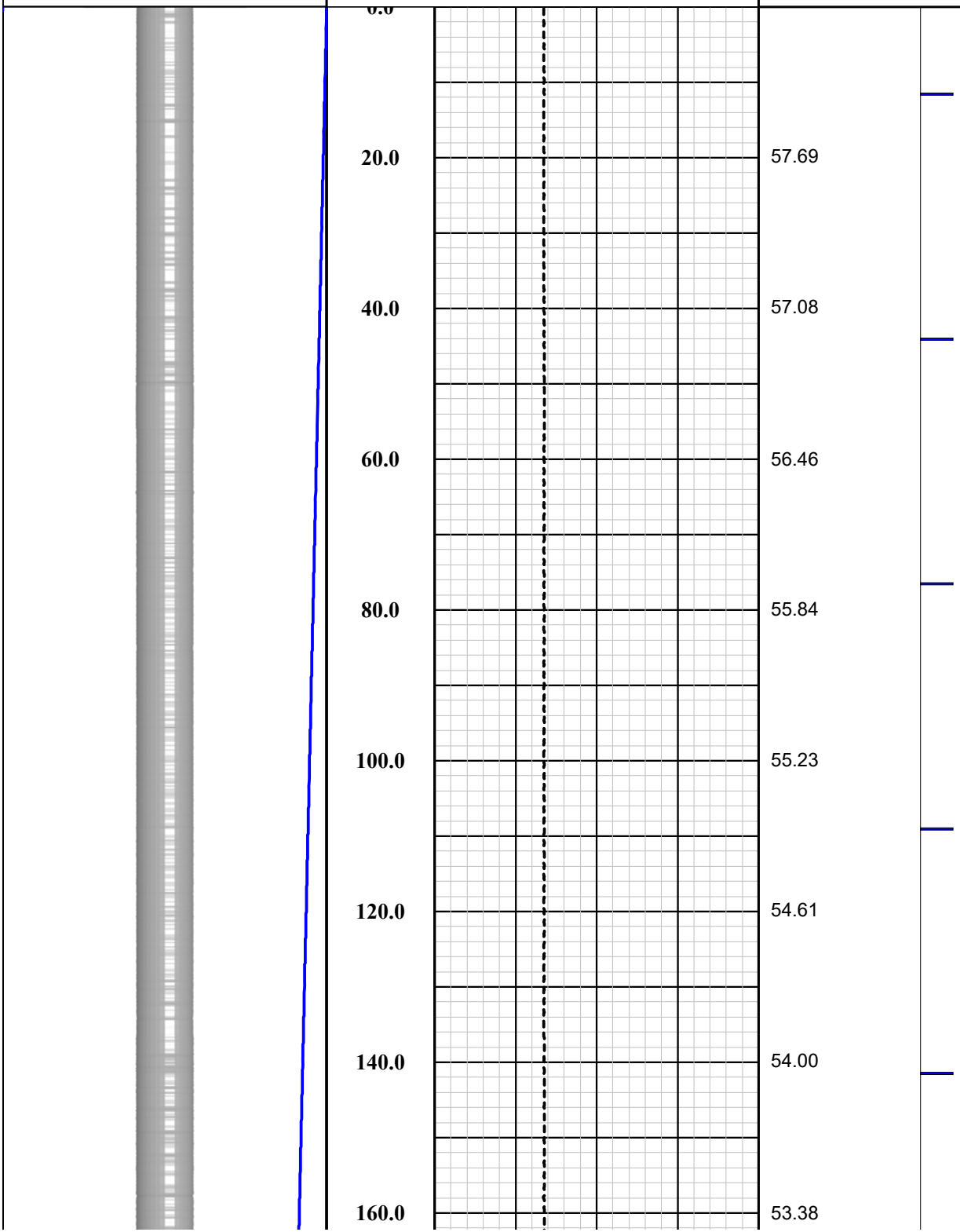
Caliper Arms Used: 16" **Calibration Points:** 8" & 23"

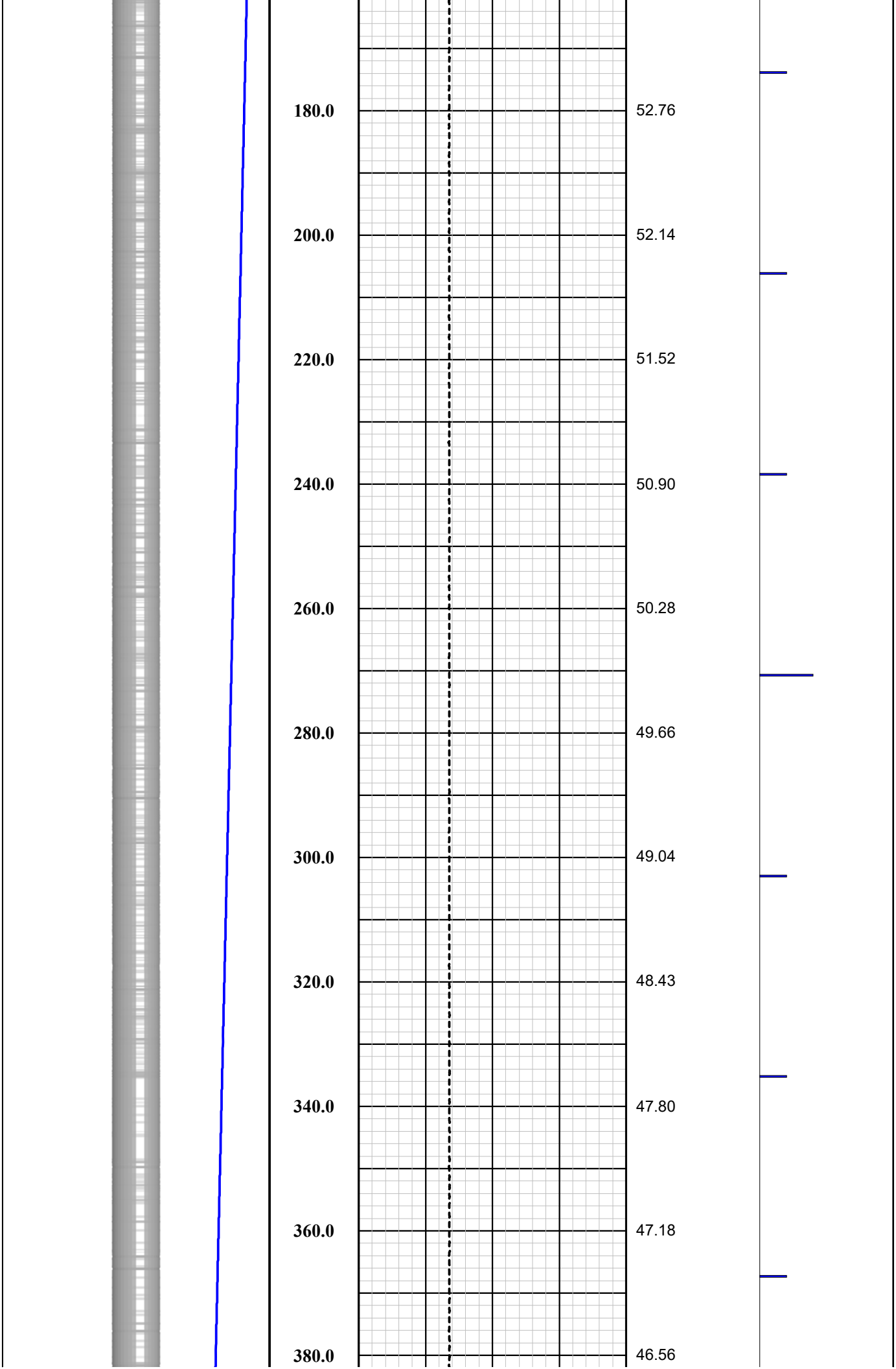
E-Log Calibration Range: 10-1000 OHM-M **Calibration Points:** 10 & 1000 OHM-M

Disclaimer:

All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

Total Volume	Depth	3-Arm Caliper	Cumulated Volume (cu.yd)
0 cu.yd 58.29	1in:20ft	0 Inches 40	
3-D View			Based on 5.5" OD Casing
-0°			

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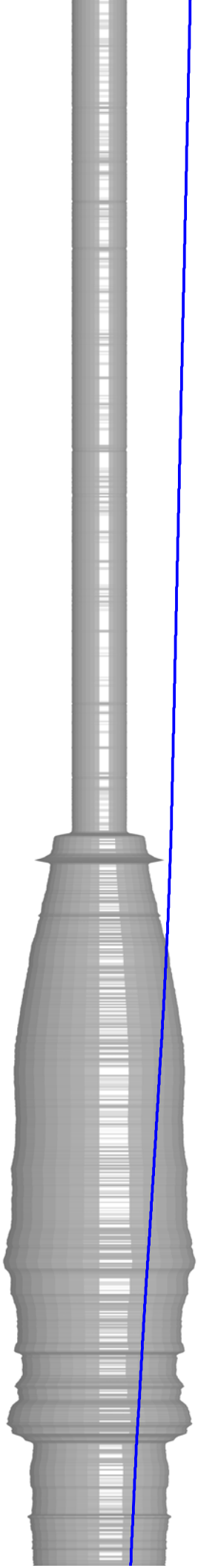
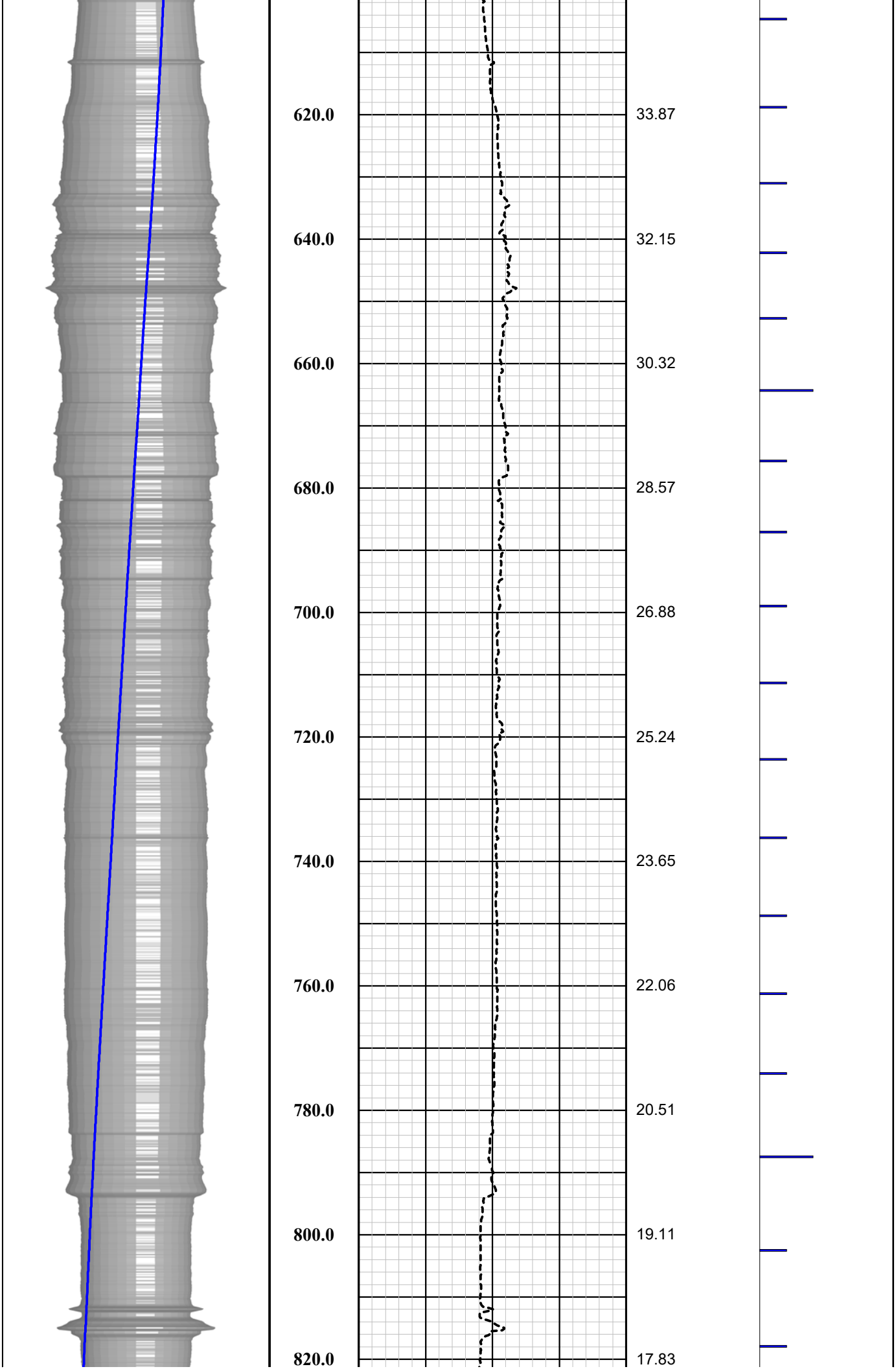


400.0	45.93
420.0	45.31
440.0	44.68
460.0	44.06
480.0	43.44
500.0	42.81
520.0	41.65
540.0	40.02
560.0	38.28
580.0	36.64
600.0	35.25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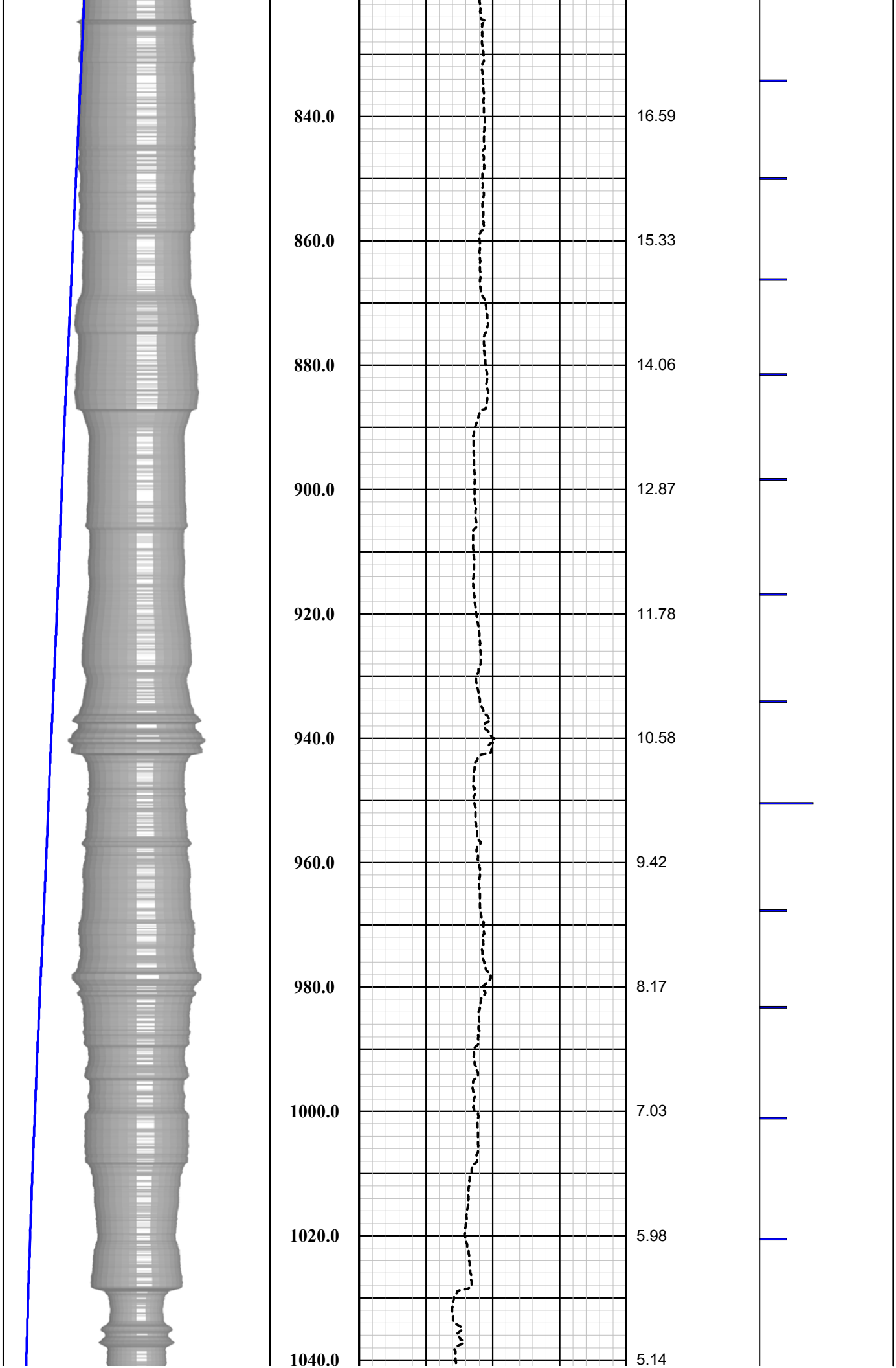
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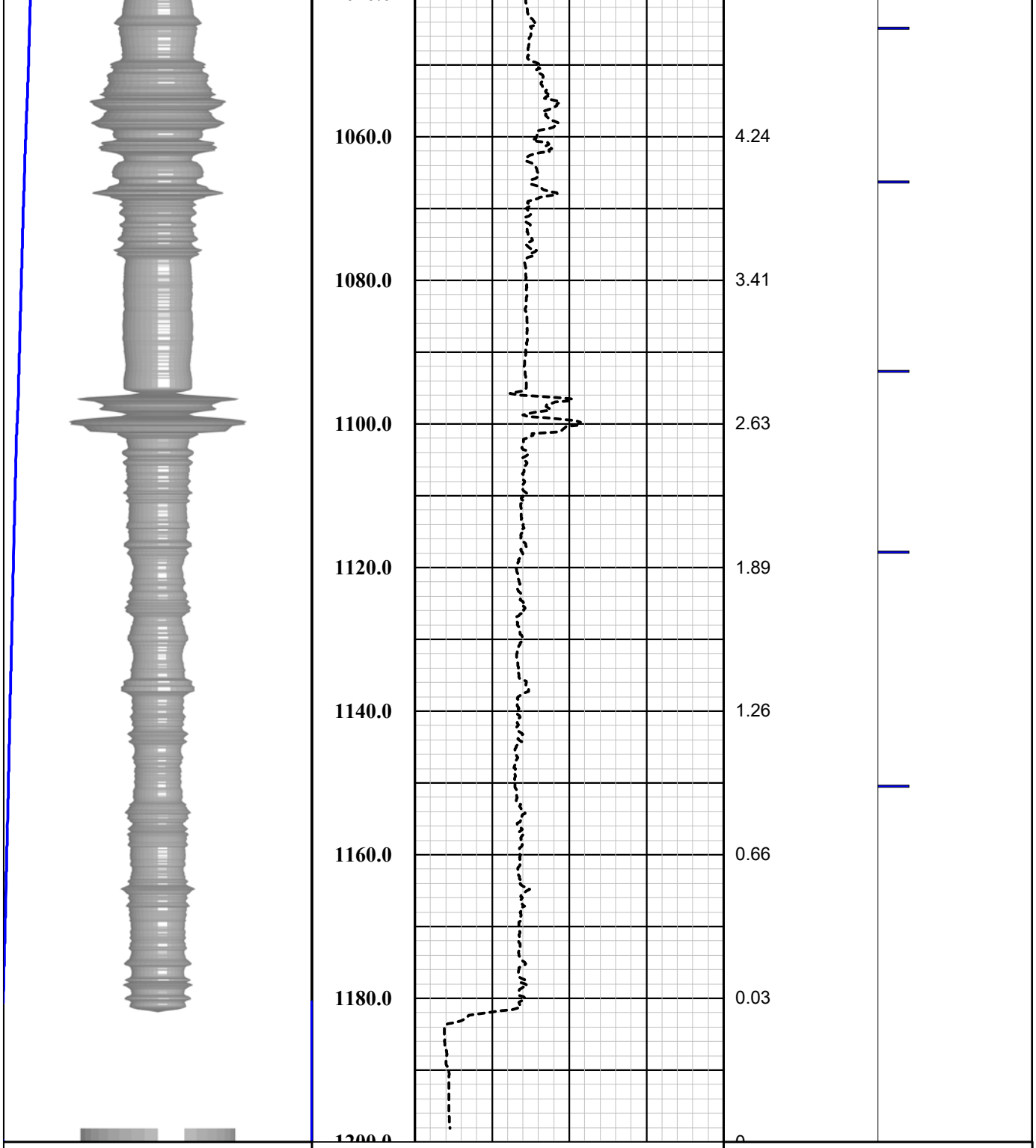
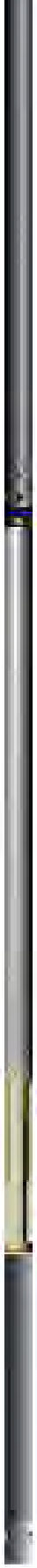


MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.

Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs



Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	I-01
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final **Caliper w / Volume Calculation Summary**

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER				
WELL ID	I-01				
FIELD	FLORENCE COPPER				
COUNTY	PINAL			STATE	ARIZONA
					OTHER SERVICES
TYPE OF LOGS: GAMMA - CALIPER					SONIC
MORE: TEMP. / FLUID RES.					4 PI DENSITY
LOCATION					DUAL DENSITY
SEC	TWP	RGE			
PERMANENT DATUM		ELEVATION		K.B.	
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM		D.F.	
DRILLING MEAS. FROM	GROUND LEVEL			G.L.	

DATE	4-26-18	TYPE FLUID IN HOLE		FORMATION WATER
RUN No	1	MUD WEIGHT		N/A
TYPE LOG	GAMMA - CALIPER - TFR	VISCOSITY		N/A
DEPTH-DRILLER	1200 FT.	LEVEL		~232 FT.
DEPTH-LOGGER	1185 FT.	MAX. REC. TEMP.		29.00 DEG. C
BTM LOGGED INTERVAL	1185 FT.	IMAGE ORIENTED TO:		N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL		0.2 FT.
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK		TRUCK #900
RECORDED BY / Logging Eng.	A. OLSON	TOOL STRING/SN		MSI COMBO TOOL SN 4183
WITNESSED BY	COLLIN - H&A	LOG TIME:ON SITE/OFF SITE		10:30 A.M.

RUN	BOREHOLE RECORD		CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT.	14 IN.	STEEL	SURFACE	500 FT.
2	20 IN.	40 FT.	500 FT.	5 IN.	FG	SURFACE	500 FT.
3	12 1/4 IN.	500 FT.	TOTAL DEPTH	5 IN.	PVC	500 FT.	TOTAL DEPTH

COMMENTS:

.

Tool Summary:

Date	4-26-18	**Date**	4-26-18	**Date**	4-26-18
Run No.	1	**Run No.**	2	**Run No.**	3
Tool Model	MSI COMBO TOOL	**Tool Model**	ALT 4 RX SONIC	**Tool Model**	COMPROBE 4 PI
Tool SN	4183	**Tool SN**	4572	**Tool SN**	6009
From	SURFACE	**From**	200 FT.	**From**	SURFACE
To	1185 FT.	**To**	1185 FT.	**To**	1185 FT.
Recorded By	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**	A. OLSON
Truck No	900	**Truck No**	900	**Truck No**	900
Operation Check	4-25-18	**Operation Check**	4-25-18	**Operation Check**	4-25-18
Calibration Check	4-25-18	**Calibration Check**	N/A	**Calibration Check**	N/A
Time Logged	10:35 A.M.	**Time Logged**	11:30 A.M.	**Time Logged**	12:20 P.M.

Date	4-26-18	**Date**		**Date**	
Run No.	4	**Run No.**	5	**Run No.**	6
Tool Model	ALT QL DENSITY	**Tool Model**		**Tool Model**	
Tool SN	6187	**Tool SN**		**Tool SN**	
From	SURFACE	**From**		**From**	
To	1185 FT.	**To**		**To**	
Recorded By	A. OLSON	**Recorded By**		**Recorded By**	
Truck No	900	**Truck No**		**Truck No**	
Operation Check	4-25-18	**Operation Check**		**Operation Check**	
Calibration Check	N/A	**Calibration Check**		**Calibration Check**	
Time Logged	1:15 P.M.	**Time Logged**		**Time Logged**	

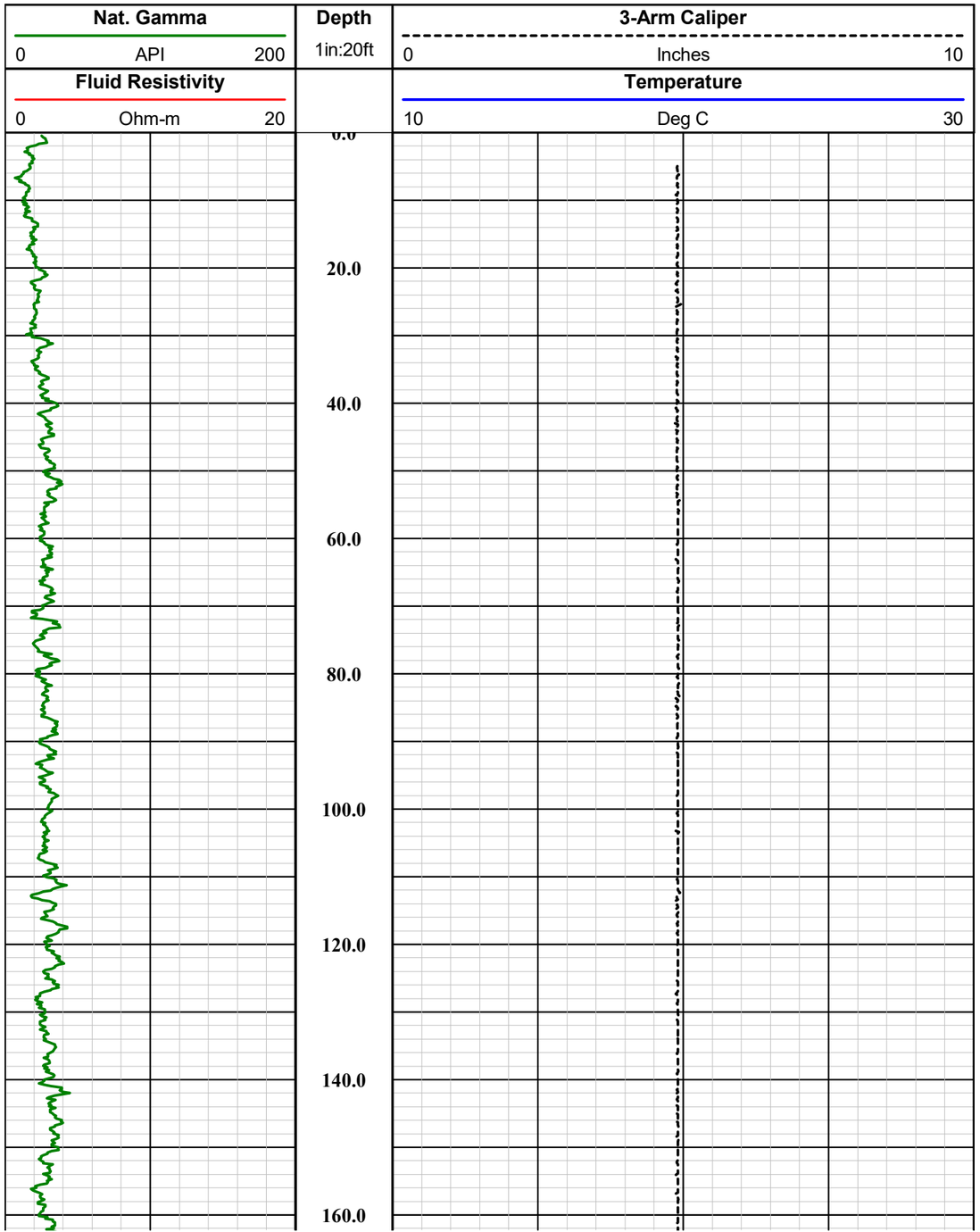
Additional Comments:

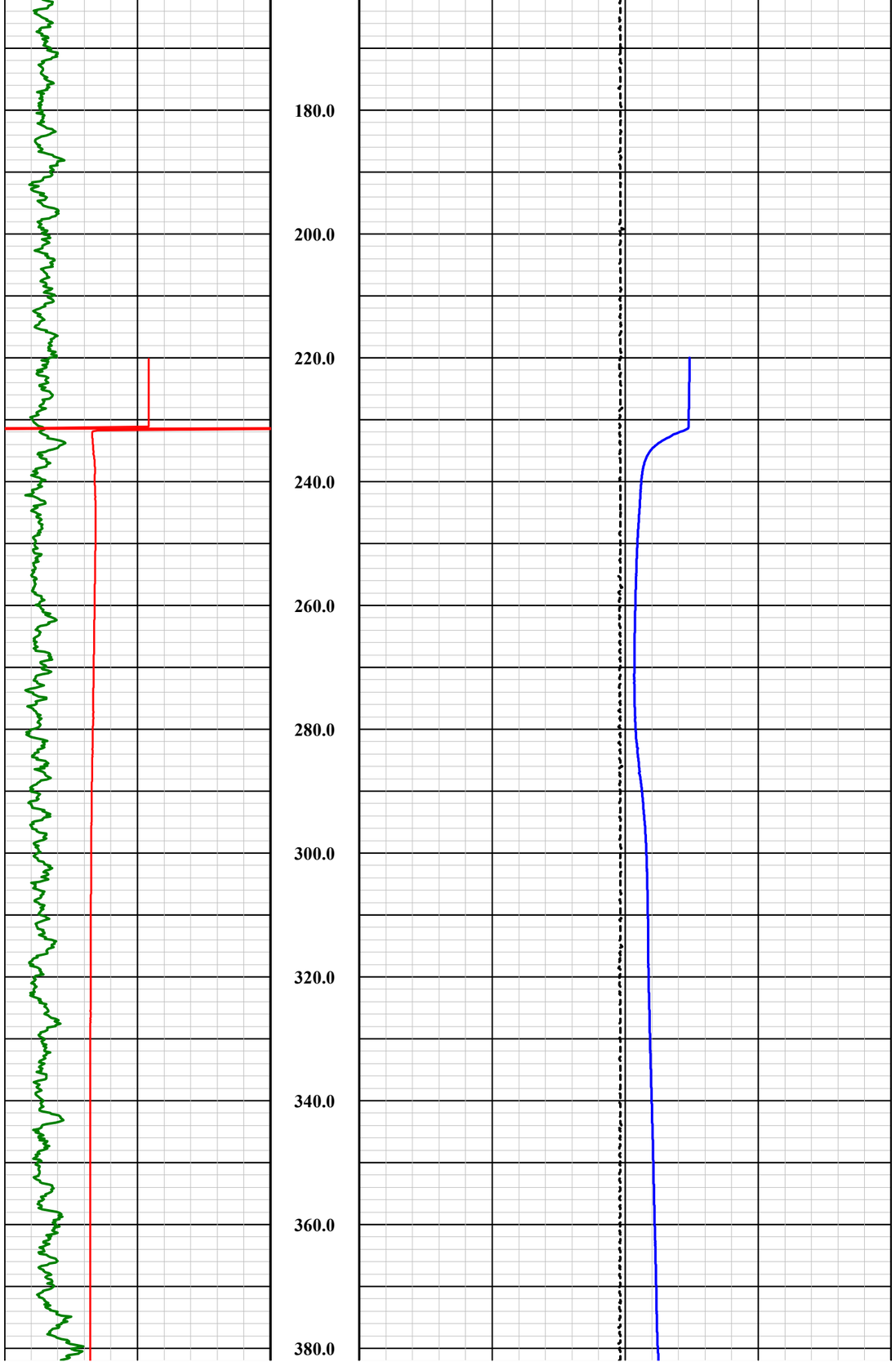
Caliper Arms Used: 9 IN. **Calibration Points:** 4 IN. & 12 IN.

E-Log Calibration Range: N/A **Calibration Points:** N/A

Disclaimer:

All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

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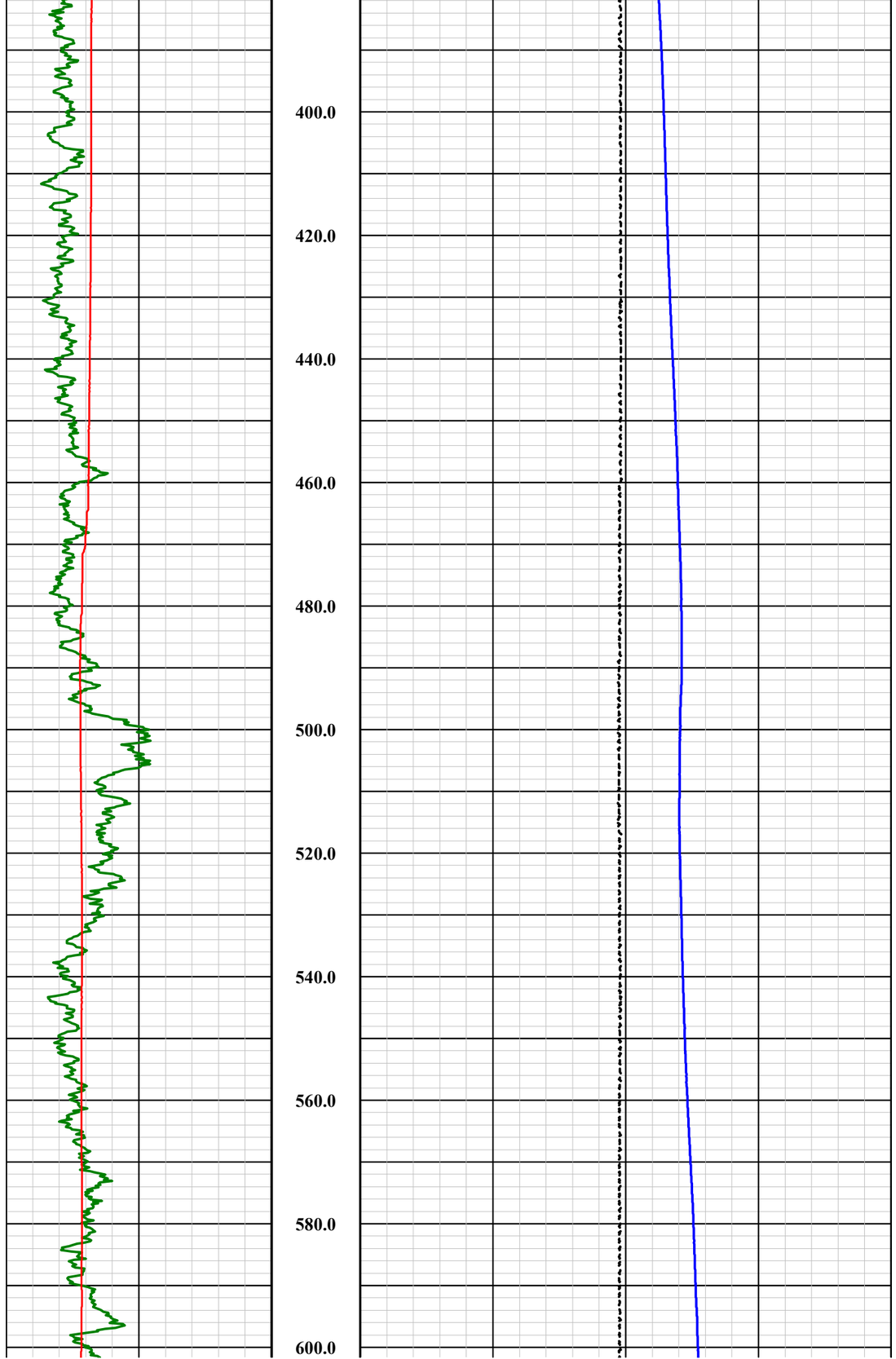
300.0
320.0
340.0
360.0
380.0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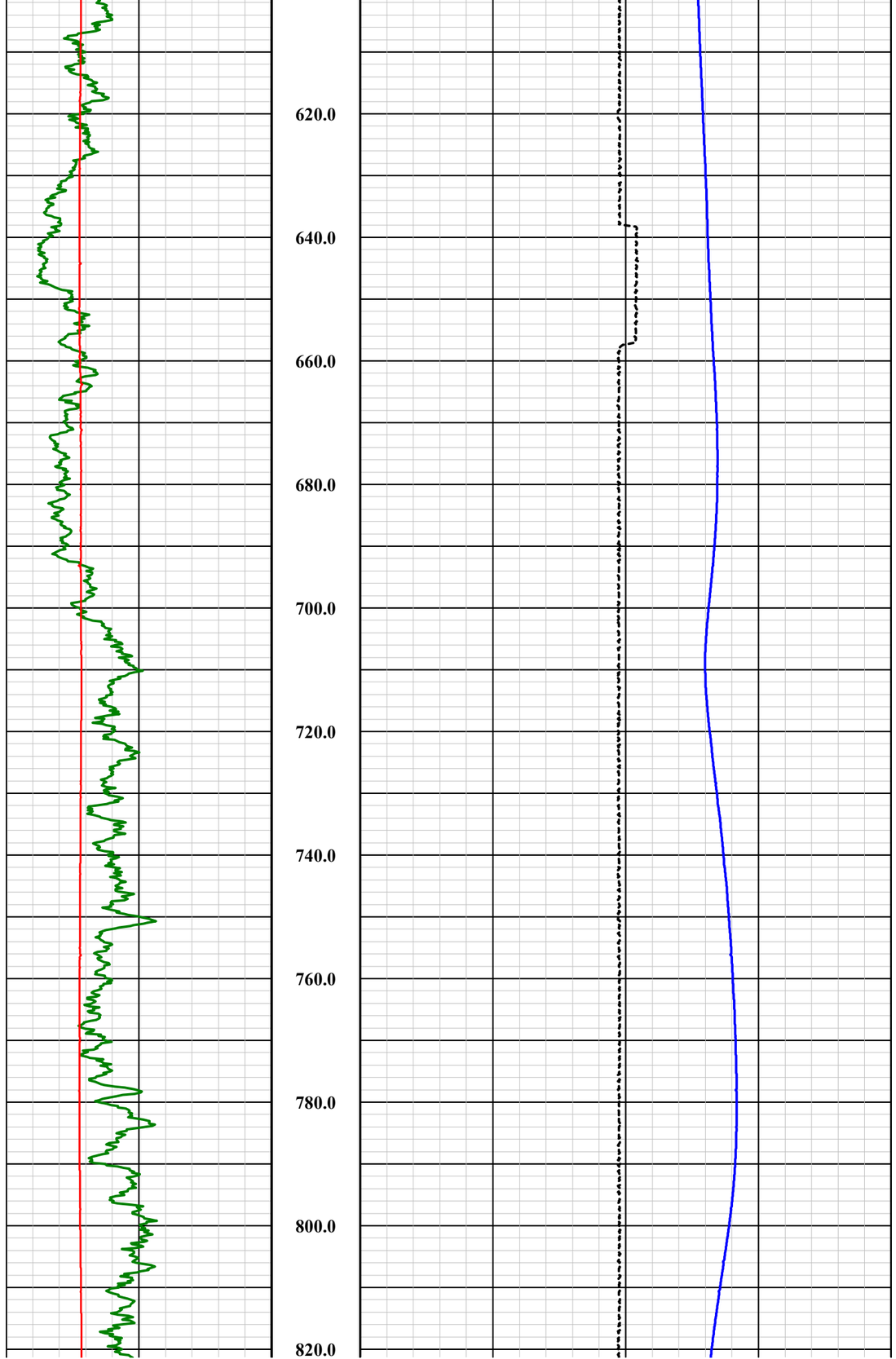
500.0
520.0
540.0
560.0
580.0
600.0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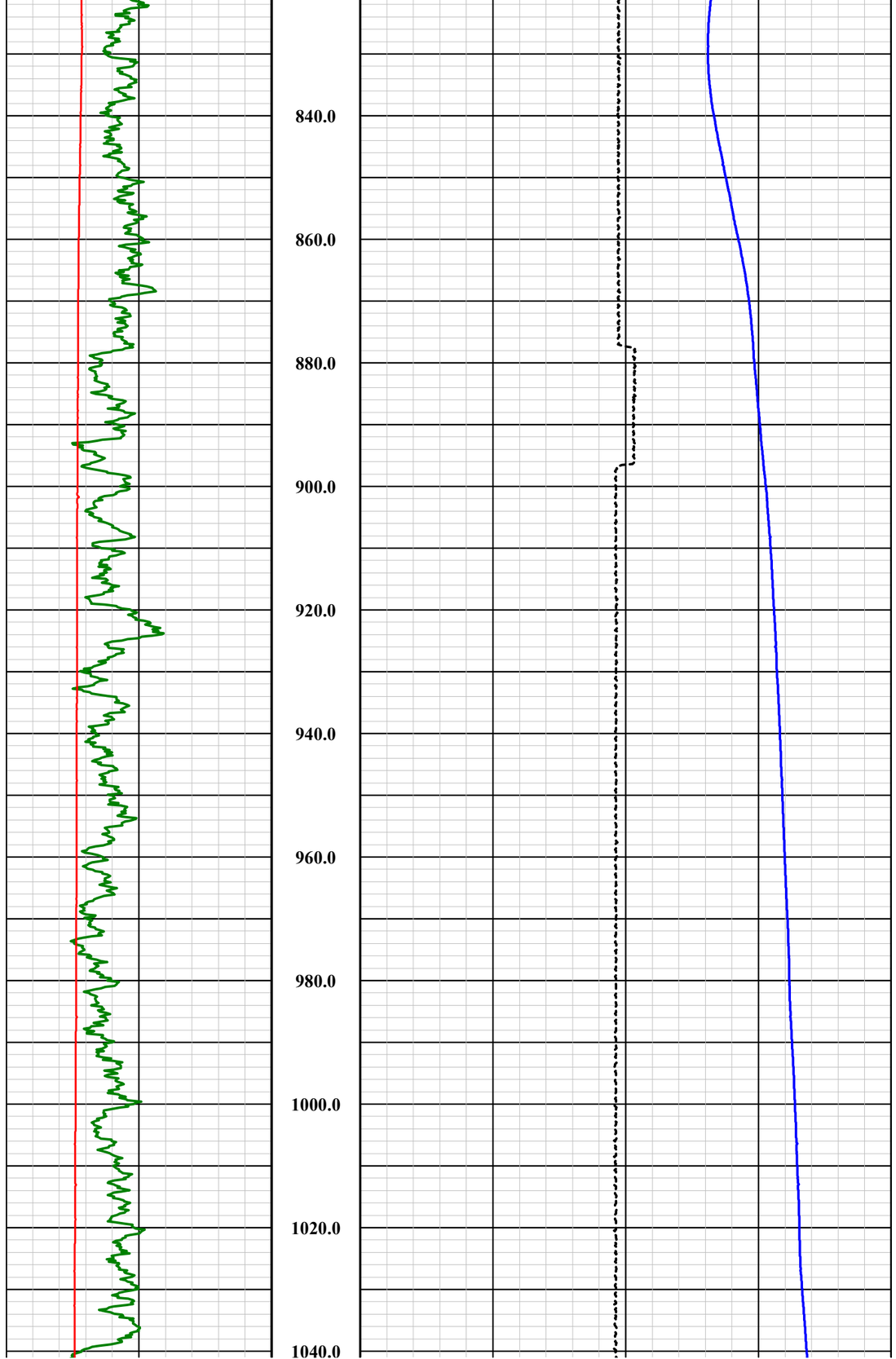
720.0
740.0
760.0
780.0
800.0
820.0


840.0
860.0
880.0
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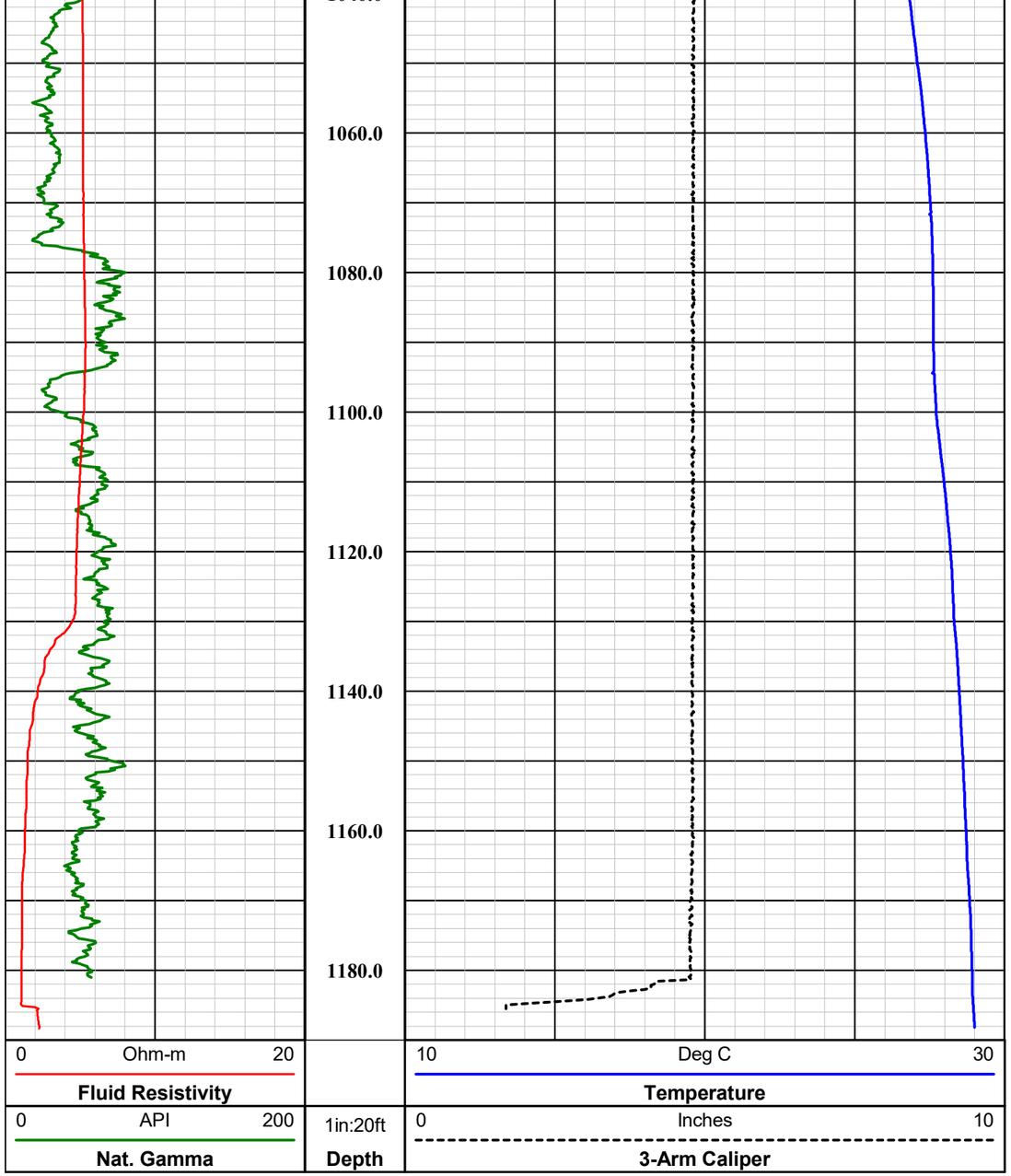
940.0
960.0
980.0
1000.0
1020.0
1040.0



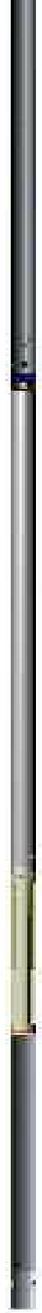
MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.

Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.



Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	I-01
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final GCT Summary

APPENDIX F

SAPT Documentation

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
STANDARD ANNULAR PRESSURE TEST

Operator FLORENCE COPPER, INC
Address 1575 W. HUNT HWY
FLORENCE, AZ 85132
Well Name I-01

State Permit No. P-101704
USEPA Permit No. R9UIC-AZ3-FY11-1
Date of Test 4/25/2018
Well Type ENV - INJECTION - Class III

LOCATION INFORMATION SW Quarter of the NE Quarter of the SW Quarter of Section 28; Range 9E; Township 4S; County PINAL;

Company Representative IAN REAM; Field Inspector LAUREN CANDREVA;

Type of Pressure Gauge Pressure tranducer with data logger inch face; 300 psi full scale; 0.001 psi increments;

New Gauge? Yes ☑ No ☐ If no, date of calibration ____ Calibration certification submitted? Yes ☐ No ☑

TEST RESULTS
Readings must be taken at least every 10 minutes for a minimum of 30 minutes for Class II, III and V wells and 60 minutes for Class I wells.
For Class II wells, annulus pressue should be at least 300 psig. For Class I wells, annulus pressure should be the greater of 300 psig or 100 psi above maximum permitted injection pressure.
Original chart recordings must be submitted with this form.

5-year or annual test on time? Yes ☐ No ☑
2-year test for TA'd wells on time? Yes ☐ No ☑
After rework? Yes ☐ No ☑
Newly permitted well? Yes ☑ No ☐

Pressure (in psig)

Time	Annulus	Tubing
15:42	175.11	same
15:52	175.19	same
16:02	175.45	same
16:12	175.64	same

Casing size 5" - NOMINAL
Tubing size 2"
Packer type INFLATABLE PACKER
Packer set @ 4.91(top), 504.49(bottom)
Top of Permitted Injection Zone 418
Is packer 100 ft or less above top of Injection Zone ? Yes ☑ No ☐
If not, please submit a justification.
Fluid return (gal.) 0.41
Comments: Three tests were conducted to confirm results all three tests are included in attached chart and table

Test Pressures: Max. Allowable Pressure Change: Initial test pressure x 0.05 8.14 psi
Test Period Pressure change 0.53 psi

Test Passed ☑ Test Failed ☐

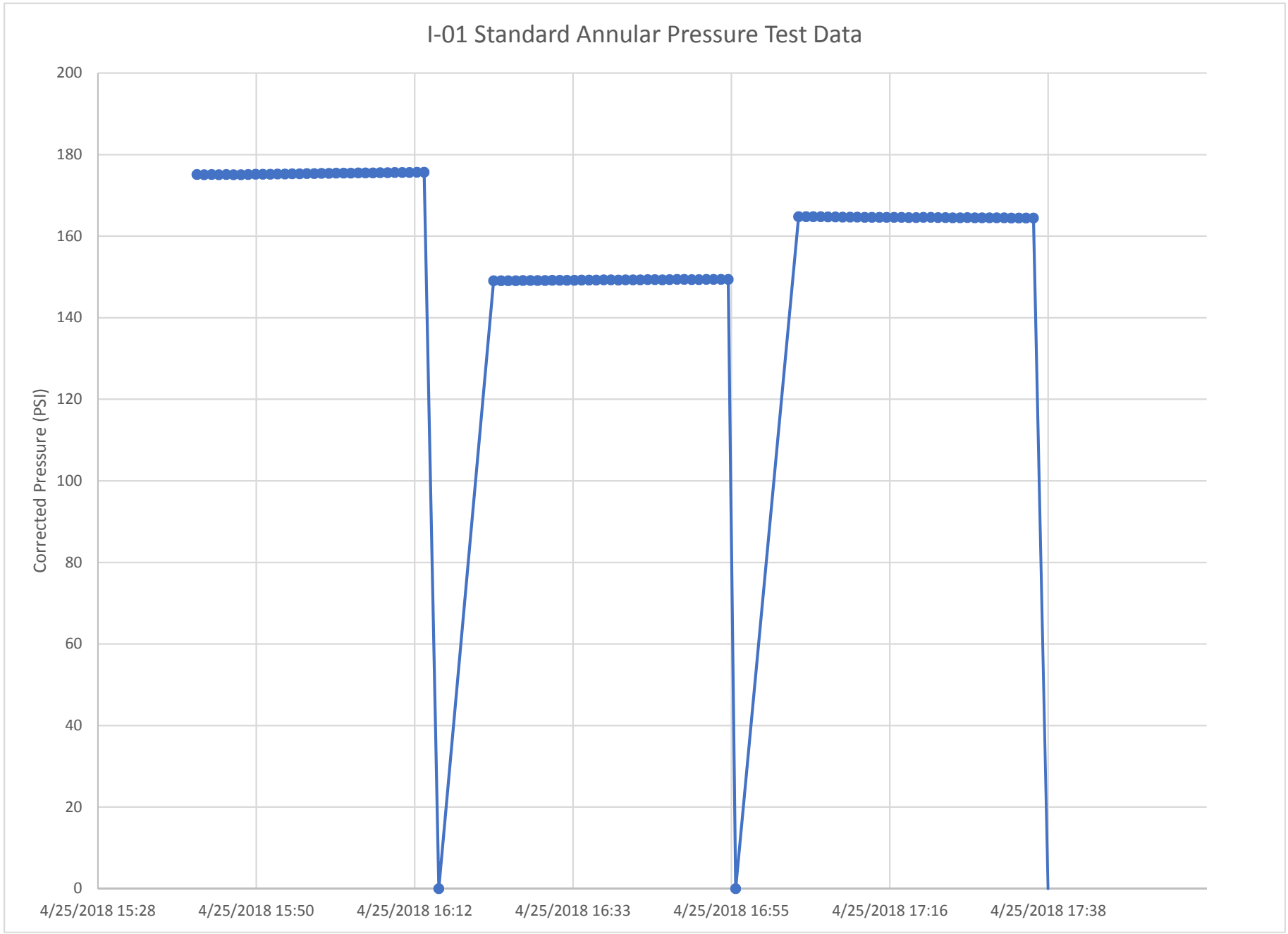
If failed test, well must be shut in, no injection can occur, and USEPA must be contacted within 24 hours. Corrective action needs to occur, the well retested, and written authorization received before injection can recommence.

I certify under penalty of law that this document and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (See 40 CFR 144.32(d))

Ian Ream
Printed Name of Company Representative

Signature of Company Representative

9-12-2018
Date


I-01 Standard Annular Pressure Test Data
Corrected Pressure (PSI)
200
180
160
140
120
100
80
60
40
20
0
4/25/2018 15:28
4/25/2018 15:50
4/25/2018 16:12
4/25/2018 16:33
4/25/2018 16:55
4/25/2018 17:16
4/25/2018 17:38

Well I-01 SAPT Data		
Tranducer Serial Number:	519257.00	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
4/25/2018 15:42	188.98	175.11
4/25/2018 15:43	188.96	175.086
4/25/2018 15:44	188.97	175.098
4/25/2018 15:45	188.95	175.077
4/25/2018 15:46	188.97	175.1
4/25/2018 15:47	188.94	175.067
4/25/2018 15:48	188.95	175.082
4/25/2018 15:49	188.99	175.114
4/25/2018 15:50	189.02	175.149
4/25/2018 15:51	189.04	175.164
4/25/2018 15:52	189.06	175.189
4/25/2018 15:53	189.09	175.222
4/25/2018 15:54	189.11	175.235
4/25/2018 15:55	189.13	175.258
4/25/2018 15:56	189.16	175.285
4/25/2018 15:57	189.20	175.326
4/25/2018 15:58	189.20	175.323
4/25/2018 15:59	189.24	175.366
4/25/2018 16:00	189.25	175.374
4/25/2018 16:01	189.30	175.427
4/25/2018 16:02	189.32	175.448
4/25/2018 16:03	189.32	175.445
4/25/2018 16:04	189.36	175.484
4/25/2018 16:05	189.38	175.506
4/25/2018 16:06	189.39	175.52
4/25/2018 16:07	189.41	175.536
4/25/2018 16:08	189.42	175.549
4/25/2018 16:09	189.46	175.59
4/25/2018 16:10	189.48	175.611
4/25/2018 16:11	189.49	175.615
4/25/2018 16:12	189.52	175.644
4/25/2018 16:13	189.53	175.661
4/25/2018 16:15	13.88	0.012
4/25/2018 16:22	162.91	149.038
4/25/2018 16:23	162.94	149.068
4/25/2018 16:24	162.94	149.065
4/25/2018 16:25	162.96	149.088
4/25/2018 16:26	162.99	149.114
4/25/2018 16:27	162.99	149.121
4/25/2018 16:28	163.01	149.135
4/25/2018 16:29	162.99	149.122

Well I-01 SAPT Data		
Tranducer Serial Number:	519257.00	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
4/25/2018 16:30	163.03	149.162
4/25/2018 16:31	163.06	149.186
4/25/2018 16:32	163.05	149.181
4/25/2018 16:33	163.07	149.196
4/25/2018 16:34	163.10	149.228
4/25/2018 16:35	163.12	149.243
4/25/2018 16:36	163.10	149.226
4/25/2018 16:37	163.14	149.266
4/25/2018 16:38	163.13	149.258
4/25/2018 16:39	163.12	149.245
4/25/2018 16:40	163.14	149.271
4/25/2018 16:41	163.17	149.298
4/25/2018 16:42	163.17	149.302
4/25/2018 16:43	163.19	149.319
4/25/2018 16:44	163.19	149.322
4/25/2018 16:45	163.18	149.311
4/25/2018 16:46	163.20	149.326
4/25/2018 16:47	163.24	149.37
4/25/2018 16:48	163.26	149.392
4/25/2018 16:49	163.21	149.338
4/25/2018 16:50	163.24	149.363
4/25/2018 16:51	163.24	149.371
4/25/2018 16:52	163.25	149.378
4/25/2018 16:53	163.26	149.39
4/25/2018 16:54	163.26	149.391
4/25/2018 16:55	13.87	0
4/25/2018 17:04	178.66	164.789
4/25/2018 17:05	178.66	164.79
4/25/2018 17:06	178.65	164.782
4/25/2018 17:07	178.62	164.749
4/25/2018 17:08	178.58	164.707
4/25/2018 17:09	178.60	164.723
4/25/2018 17:10	178.56	164.684
4/25/2018 17:11	178.54	164.664
4/25/2018 17:12	178.51	164.64
4/25/2018 17:13	178.50	164.631
4/25/2018 17:14	178.50	164.624
4/25/2018 17:15	178.49	164.619
4/25/2018 17:16	178.48	164.606
4/25/2018 17:17	178.48	164.607
4/25/2018 17:18	178.47	164.6

Well I-01 SAPT Data		
Tranducer Serial Number:	519257.00	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
4/25/2018 17:19	178.43	164.555
4/25/2018 17:20	178.43	164.56
4/25/2018 17:21	178.46	164.586
4/25/2018 17:22	178.45	164.578
4/25/2018 17:23	178.41	164.534
4/25/2018 17:24	178.43	164.559
4/25/2018 17:25	178.39	164.518
4/25/2018 17:26	178.38	164.505
4/25/2018 17:27	178.40	164.53
4/25/2018 17:28	178.37	164.497
4/25/2018 17:29	178.36	164.488
4/25/2018 17:30	178.37	164.5
4/25/2018 17:31	178.37	164.497
4/25/2018 17:32	178.35	164.479
4/25/2018 17:33	178.33	164.46
4/25/2018 17:34	178.33	164.461
4/25/2018 17:35	178.31	164.436
4/25/2018 17:36	178.32	164.45
4/25/2018 17:38	13.86	-0.01

APPENDIX G

Cement Bond Log Summary

WELL I-01

Geophysical Log Summary

COMPANY:	FLORENCE COPPER COMPANY	Logging Engineer:	VARIOUS
FIELD:	FLORENCE COPPER SITE	Date Logged:	VARIOUS
WELL ID:	I-01	Processed By:	K.M / B.C.
COUNTY:	PINAL STATE: ARIZONA	Date Processed:	07-18-18

Southwest Exploration Services, LLC
borehole geophysics & video services

HALEY ALDRICH

I-01 Sonic CBL with Density Summary

Depth
1in:20ft

Nat. Gamma — Cased 4-26-18 — 0 API 200

3-Arm Caliper — Cased 4-26-18 — 0 Inches 10

Comp Density — Cased 4-26-18 — -1 g/cc 4

Compensation — Cased 4-26-18 — -4 g/cc 1

RX1 - VDL (60mm) - Btm — Open 3-5-18 — 100 uSec 1000

RX1 - TT (60mm) - Btm — Open 3-5-18 — 100 uSec 1000

RX1 - VDL (60mm) - Top — Cased 12-7-17 — 100 uSec 1000

RX1 - TT (60mm) - Top — Cased 12-7-17 — 100 uSec 1000

Bond Index — 0 % 100

RX1 - VDL — Cased 4-26-18 — 100 uSec 1020

RX1 - TT — Cased 4-26-18 — 100 uSec 1020

RX4 - VDL — Cased 4-26-18 — 100 uSec 1020

RX4 - TT — Cased 4-26-18 — 100 uSec 1020

Velocity Analysis — Cased 4-26-18 — 40 us/ft 220

P-Wave Slow — Cased 4-26-18 — 40 us/ft 220

Steel — 40 us/ft 220

FRP — 40 us/ft 220

PVC — 40 us/ft 220

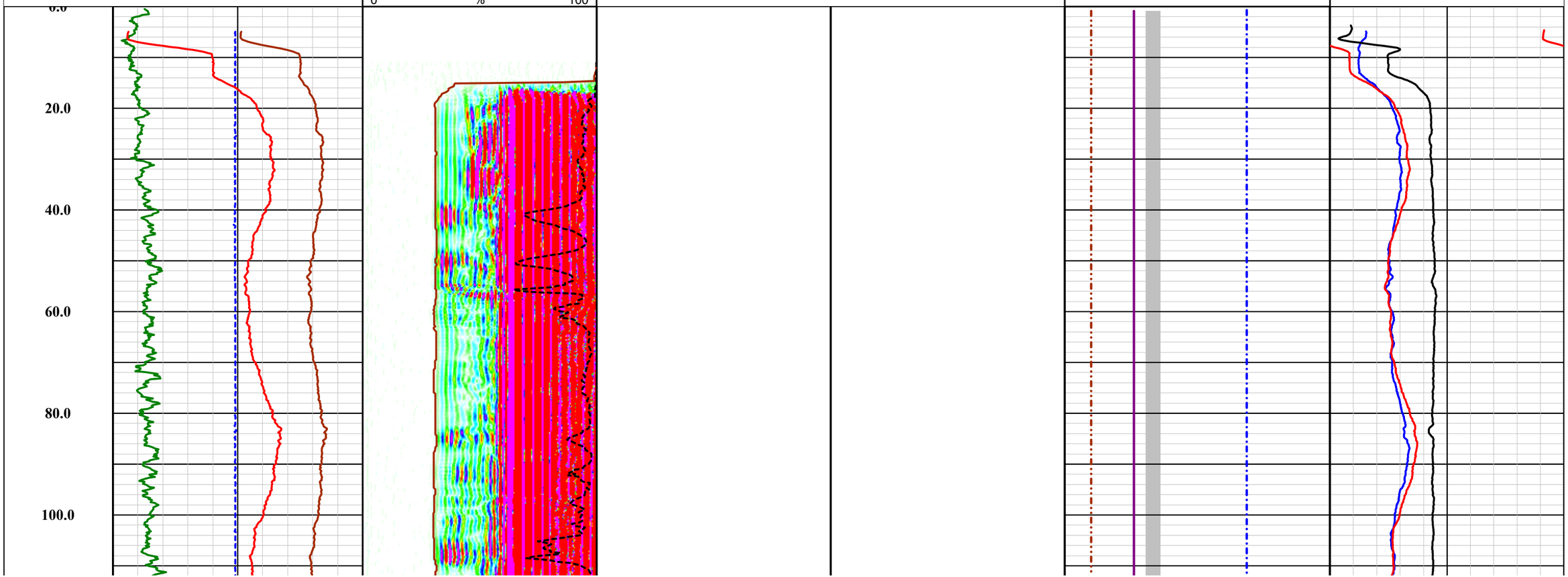
Cement

Near Density — Cased 4-26-18 — 1 g/cc 4

Far Density — Cased 4-26-18 — 1 g/cc 4

4 Pi Density (Dry) — Cased 4-26-18 — 2000 CPS 0

4 Pi Density (Wet) — Cased 4-26-18 — 400 CPS 0



120.0

140.0

160.0

180.0

200.0

220.0

240.0

260.0

280.0

300.0

320.0

Fluid Level ~228.7'

340.0

360.0

380.0

400.0

420.0

440.0

460.0

480.0

500.0

520.0

540.0

560.0

580.0

600.0

620.0

640.0

660.0

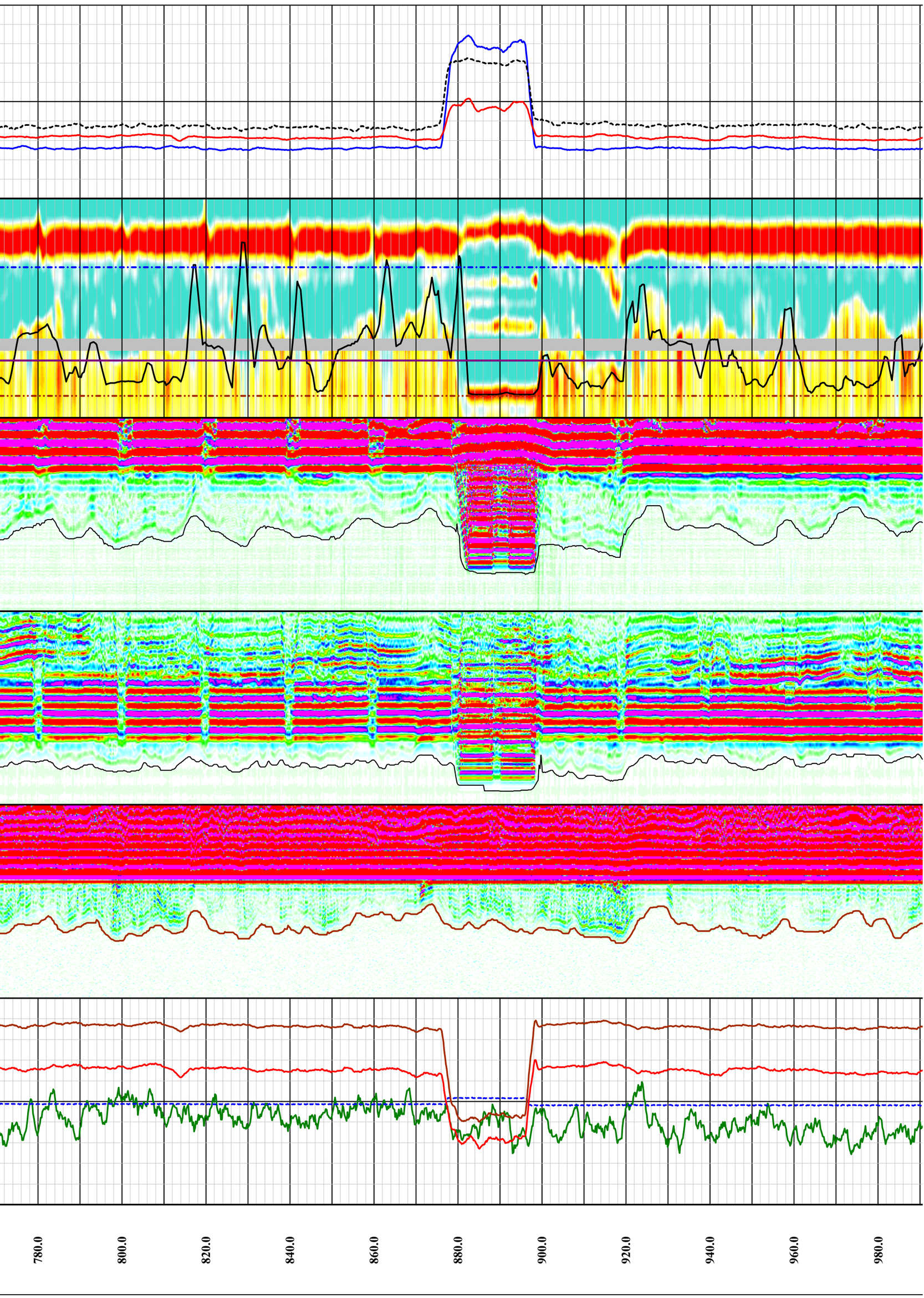
680.0

700.0

720.0

740.0

760.0


780.0
800.0
820.0
840.0
860.0
880.0
900.0
920.0
940.0
960.0
980.0

1000.0

1020.0

1040.0

1060.0

1080.0

1100.0

1120.0

1140.0

1160.0

1180.0

1200.0

0 % 100

Bond Index

Cement

	Bond Index					
-4 g/cc 1 Cased 4-26-18 **Compensation**	100 uSec 1000 Cased 12-7-17 **RX1 - TT (60mm) - Top**			40 us/ft 220 **PVC**	400 CPS 0 Cased 4-26-18 **4 Pi Density (Wet)**	
-1 g/cc 4 Cased 4-26-18 **Comp Density**	100 uSec 1000 Cased 12-7-17 **RX1 - VDL (60mm) - Top**			40 us/ft 220 **FRP**	2000 CPS 0 Cased 4-26-18 **4 Pi Density (Dry)**	
				40 us/ft 220 **Steel**		
0 Inches 10 Cased 4-26-18 **3-Arm Caliper**	100 uSec 1000 Open 3-5-18 **RX1 - TT (60mm) - Btm**	100 uSec 1020 Cased 4-26-18 **RX1 - TT**	100 uSec 1020 Cased 4-26-18 **RX4 - TT**	40 us/ft 220 Cased 4-26-18 **P-Wave Slow**	1 g/cc 4 Cased 4-26-18 **Far Density**	
0 API 200 Cased 4-26-18 **Nat. Gamma**	100 uSec 1000 Open 3-5-18 **RX1 - VDL (60mm) - Btm**	100 uSec 1020 Cased 4-26-18 **RX1 - VDL**	100 uSec 1020 Cased 4-26-18 **RX4 - VDL**	40 us/ft 220 Cased 4-26-18 **Velocity Analysis**	1 g/cc 4 Cased 4-26-18 **Near Density**	
1in:20ft **Depth**	**I-01 Sonic CBL with Density Summary**					

APPENDIX H

Well Development Field Forms

DEVELOPMENT
FIELD DATA LOG

Project Name: FCI	Project No.: 129687-007
Well No.: I-01	Date: 4/4/18
Location: Florence, AZ	Measuring Point:
Total Depth of Well (ft bls): 1200	Screen Interval (ft bls):
Pump Type/Setting (ft bls): AIRLIFT /	Activity: AIRLIFT
How Q Measured: 5 gal bucket	H&A Personnel: G.F.

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (μmhos/cm)	Temp. °C	Turbidity NTU	Comments
2300	~5	—	—	TR	8.07	1475	22.18	0012	
4/5/18 0100	~5	—	—	0	8.10	1450	22.21	173	move up ~ sand
0230	~5	—	—	0	8.07	1520	18.4	67.7	@ 600'
0240	~5	—	—	0	8.16	1578	19.04	74.9	
0255	~5	—	—	0	8.29	1638	19.53	122	
0320	~5		—	0	8.14	1644	18.41	89.2	
0330	~5		—	0	8.17	1507	18.16	132	
0445	~8		—	0	7.97	1602	19.47	172	~~800~~ ~~720~~ 778
0505	~8		—	TR	8.22	1698	~~20.80~~	130	
0525	~8		—	0	8.21	1685	20.77	73.1	
0550	~8		—	0	8.26	1744	21.99	73	
0655	~								air lift off
									lower to ~1000'
0850	~10								Air on, 1004'
0855	~10			0.1	7.95	1836	22.51	64.2	cloudy
0940	~10			<0.1	8.12	1840	24.02	43.5	cloudy
1115	~10			0	8.18	1816	24.52	18.7	Clear
1425	~10			0	8.06	1830	25.02	18.0	clear
1515	~10			0	8.21	1832	24.89	16.1	clear
1715									air on @ 1134'
1717	~10			0.2	7.94	1826	23.74	105	gray cloudy
1748	~10			0	8.07	1824	24.22	41.9	cloudy
1750									off
4-6-18 ~~0808~~									@ 1139', surge before
									letting run
0826	~10			10.0	8.30	1834	22.00	OR	turbid, brown/gray
0840	~10			0.4	8.25	1617	22.97	335	Gray, @ 1144
0905	~10			7.1	8.31	1815	24.22	275	gray, @ 1145

Comments:

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HALEY ALDRICH

DEVELOPMENT
FIELD DATA LOG

Project Name: FCI PTF	Project No.: 129687
Well No.: I-01	Date: 4-6-18 + 4/7/2018
Location: Florence AZ	Measuring Point:
Total Depth of Well (ft bls): 1300	Screen Interval (ft bls):
Pump Type/Setting (ft bls): Airlift	Activity: Airlift
How Q Measured: Estimates	H&A Personnel: C. Price - M. Cote (MAC)

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (µmhos/cm)	Temp. °C	Turbidity NTU	Comments
0935	~10			0.5	8.33	1819	25.01	54.3	cloudy @ 1145
0958	~10	Fine sand →		50	8.27	1816	24.71	OR	Brown
1010	~10	gravel →		4.5	8.36	1833	25.19	226	Lt Brown
1040	~10	SAA →		3.0	8.32	1832	25.56	67.3	SL cloudy
1110	~10			0.2	8.31	1820	25.67	20.7	clear
1144	~10	Fine sand →		30	8.28	1823	25.53	OR	Brown 1150'
1204	~10	gravel →		35	8.31	1829	26.03	317	lt Brown
1213	~10	SAA →		8.0	8.28	1831	25.78	169	lt brown
1238	~10	SAA →		2.0	8.29	1830	26.17	45.1	cloudy
1303	~10			0.1	8.29	1832	26.30	21.3	clear
1332	~10	sand/gravel		8.0	8.23	1826	26.09	OR	Brown 1160'
1405	~10			0.1	8.27	1834	26.44	44.1	cloudy
1534	~10			0.0	8.28	1830	25.47	36.3	SL cloudy
1553	~10	sand →		60	8.23	1825	25.10	OR	Brown 1167
1630	~10			<0.1	8.26	1831	25.57	26.1	clear 1167
1750	~5	SAND —		80	8.21	1800	24.62	OR	BROWN @1190
1830	~10	SAND		50	8.12	1737	22.45	OR	BROWN @1199
1850	~10			0.1	8.13	1760	23.00	261	CLOUDY
1900	~10			0.3	8.13	1757	23.00	115	CLOUDY
1910	~10			0.5	8.12	1762	23.01	64.5	CLOUDY
1920	~10			0	8.17	1766	23.14	31.5	CLEAR
1930	~10			0	8.19	1770	23.45	22.6	CLEAR - END
4/7/2018 1220	Begin "chlorine" injection; 1350 complete. Then swab; let sit overnight w/chlorine.								
0732	Begin airlift. Eductor @ 422'; airline @ 300'								Total Cl_2 (mg/L) Free Cl_2 (mg/L)
0745	~2	422 / 300	Silty sand + coal spar sands	4mL/SS	7.55	1685	20.34	618	0.00 0.00 Yellow Brown
0815	~2	422 / 315		0	8.15	1727	21.97	142	— — Yellow Br.
0840	~2	422 / 315		0	8.27	1747	22.07	88.5	— — Yellow Br.
0930		616 / 530		0.1	8.07	1973	23.32	147	(red-brown) 0.0 Clear

Comments:

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HALEY ALDRICH

DEVELOPMENT
FIELD DATA LOG

Project Name: FCI - PTF	Project No.: 129687
Well No.: I-01	Date: 4/3/2018 + 4/9/2018
Location: Florence, AZ	Measuring Point:
Total Depth of Well (ft bls): 1200'	Screen Interval (ft bls):
Pump Type/Setting (ft bls): air lift see below	Activity: Air lift chlorine
How Q Measured: Bucket @ tank + stopwatch	H&A Personnel: M. Cole (more)

Time	Discharge (gpm)	Pumping Water Level E (ft) A	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (µmhos/cm) mS/cm	Temp. °C	Turbidity NTU	Comments: Total Cl2 (mg/L)	Free Cl2 (mg/L)	
~~1000~~											
~~1000~~	~10	616 530	NM	0	8.23	3598	23.36	20.7	4.40 [clear]	0.00	cloudy,
1030	~10	616 530	NM	0	8.23	3957	24.13	12.9	4.40 [yellow]	—	
1100	~10	616 530	NM	0	8.18	3746	24.49	7.45	—	—	
1130	~10	616 530	NM	0	8.11	3730	24.56	5.39	—	—	slightly cloudy clear
1200	~10	616 530	NM	0	8.12	3558	24.99	8.53	—	—	
1230	~10	616 530	NM	0	8.11	3413	24.96	6.54	1.41 [yellow]	—	
1300	~10	616 530	NM	0	8.12	3225	24.83	10.6	—	—	clear
1330	~10	616 530	NM	0	8.11	3096	24.98	8.32	0.67 peachy yellow	—	clear
~~1445~~	~9	810 530	NM	0	8.06	3048	24.02	57.4	0.66 peachy yellow	4.40 [pink]	cloudy
1500	~9	810 530	NM	0	7.97	3035	24.40	29.6	0.48 yellow	4.40 [pink]	clear
1530	~9	810 530	NM	0	8.07	3099	24.73	33.1	—	—	
1600	~10	810 530	NM	0	7.82	2983	25.76	24.9	—	4.40 [pink]	clear
1630	~9	810 530	NM	0	8.09	2924	24.90	14.8	—	—	
1730	~9	810 530	NM	0	8.04	2823	24.88	8.26	—	4.40 [pink]	clear
		1040 530	NM								
~~1845~~ 1845	~10	1004 530	NM	0	7.97	2977	23.48	603.0	4.40 PINK	4.40	cloudy
1915	~10	1004 530	NM	0	7.96	2749	23.51	36.0	4.40 PINK	4.40	cloud
2000	~10	1004 530	NM	0	8.05	2640	23.65	26.3	4.40 PINK	4.40	~~cloudy~~ clear
2100	~10	1004 530	NM	0	8.03	2550	23.28	15.4	4.40 PINK	4.40	
2215	~10	1004 530	NM	0	8.04	2415	22.96	12.6	4.40 PINK	4.40	
2330	~10	1004 530	NM	0	8.17	2294	22.26	5.54	4.40 PINK	4.40	
0811	Begin @	1199 530	NM					~~120~~			
0815	~9	1199 530	NM	0.4 fine sand	7.96	2232	22.11	120	4.40+ [pink]	2.13	brown → yellow/brown
0845	~9	1199 530	NM	8 C-F sand	8.07	3318	23.61	109	—	—	
0915	~8	1199 530	NM	5 fine pieces	8.19	3068	24.04	83.6	—	—	
0945	~8	1199 530	NM	1.25 fine	8.19	2911	24.71	34.4	—	—	
1030	~9	1199 530	NM	0.2 fine	8.17	2762	24.81	24.4	4.40+ [pink]	—	cloudy
1100	~9	1199 530	NM	1 fine pieces	8.20	2713	25.12	25.8	—	—	cloudy

4/7/2018 OFF @ 0045

Comments:
E = Eductor depth ; A = air line depth

HALEY ALDRICH

DEVELOPMENT
FIELD DATA LOG

Project Name: [illegible]	Project No.: [illegible]
Well No.: I-01	Date: [illegible]
Location: [illegible]	Measuring Point:
Total Depth of Well (ft bls): [illegible]	Screen Interval (ft bls):
Pump Type/Setting (ft bls):	Activity: [illegible]
How Q Measured: [illegible]	H&A Personnel: [illegible]

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (µmhos/cm)	Temp. °C	Turbidity NTU	Comments
1:20	[illegible]	[illegible]	N.M.	[illegible]	8.21	[illegible]	22.31	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	NM	[illegible]	8.23	[illegible]	[illegible]	[illegible]	clear
[illegible]	[illegible]	[illegible]	NM	0.1	8.25	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	~6	[illegible] 532	NM	0.3	8.23	2499	25.47	6.07	clear
[illegible]	[illegible]								
[illegible]	~13.5	[illegible] 532	NM	1.5	8.18	2449	25.42	65.3	[illegible]
[illegible]	~13	[illegible] 532	NM	0.1	8.21	2445	25.10	[illegible]	cloudy
[illegible]	~13	[illegible] 532	NM	1.5	8.21	2355	25.11	12.7	clear
[illegible]	~13.5	[illegible] 532	NM	0.5	8.23	2355	25.24	12.5	clear
1530	~13.5	1199 532	NM	0	8.23	2225	25.11	9.44	clear #40 [illegible] mg/L
1605	~13.5	1199 532	NM	<0.1	8.18	2324	25.57	10.1	[illegible] 27 @ 1620
1645	~13	1199 530	NM	1.25	8.22	2293	25.75	14.9	
1750	~13	1199 530	NM	<0.1	8.24	2230	25.25	10.6	clear
1800	Airlift off for the night.								
4/10/2018 0700	~13	1199 530	NM	<0.1	7.77	2020	20.66	54.4	cloudy [illegible]
0715	~13	1199 530	NM	[illegible]	8.20	[illegible]	22.08	[illegible]	[illegible]
0725	~13	1199 530	NM	<0.1	8.26	2339	22.43	50.5	cloudy
1800	~13	1199 530	NM	<0.1	8.21	2443	24.24	7.91	clear *readings [illegible]
~~[illegible]~~ Missed readings due to battery failure.									
~~[illegible]~~ 1900	~62	~~763 → 723.4~~							

Pump at 763 could not set deeper

[illegible]

Comments:
[illegible]

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DEVELOPMENT
FIELD DATA LOG

Project Name: FCI - PTF	Project No.: 129687-007
Well No.: I-01	Date: 4/10/18 + 4/11/18
Location: Florence, AZ	Measuring Point:
Total Depth of Well (ft bls): 1700	Screen Interval (ft bls):
Pump Type/Setting (ft bls):	Activity: pump chlorine / pump
How Q Measured: Flowmeter + Stopwatch	H&A Personnel: CTS / MM + ETF

(margin)	Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (µmhos/cm)	Temp. °C	Turbidity NTU	Comments: Free Cl₂ (mg/L)		Total Cl₂ (mg/L)	(margin)
could not get pump past 763'	1900	~62	763' ▽231.4	3.10	0	7.65	2048	24.98	12.5	2.04	Pink	2.16	Clear
	2000	~62	▽255.1	74.4	0	7.70	1968	24.92	7.66	—		—	Clear
	2100	~62	▽256.4	310	0	7.68	1921	24.44	4.20	—		—	Clear
	2200	~62	▽256.10	62	0	7.73	1899	24.86	2.26	0.68	Lt. Pink	0.96	clear
	0000	~62	▽257.6	88.6	0	7.69	1863	24.31	7.39	—		—	Clear
	0100	~62	▽258.3	155	0	7.57	1845	23.94	1.69	—		—	clear
	0230	~62	▽258.7	620	0	7.80	1837	24.01	2.03	0.22	Lt. Pink/clear	0.14	clear
	0330	~62	▽258.8	124	0	7.76	1839	24.04	2.23	—		—	Clear
	0530	~62	▽259.3	413	0	7.75	1833	23.90	3.88	0.14	Clear	0.29	Clear
	0610	~62	▽259.45		0	7.83	1861	25.00	2.94				clear
	0640	~62	▽259.45	137.7	0	7.84	1865	25.18	4.17				
	0710	~62	▽259.		0	7.76	1874	25.39	4.42				
	0728	Surge - OFF —		—	—	—	—	—	—				
0750 ON	0752	~62	▽256.83	3100	0	7.70	1850	24.65	6.77	clear			
	0805	~62	▽256.85		0	7.72	1875	25.59	8.59	clear			
OFF	0820	~62	▽256.85	72.9	0	7.76	1871	25.26	2.51	clear			
ON	0835	~62	▽256.6	38.3	0	7.69	1865	25.20	6.74	clear			
	0850	~62	▽257.42	344.1	0	7.73	1894	25.95	2.99	clear			
OFF	0905	~62	▽257.80	40.1	0	7.73	1890	25.85	3.70	clear			
ON	0920	~62	▽256.28	56.4	0	7.73	1866	25.77	3.94	clear			
	0935	~62	▽257.38	103.4	0	7.73	1892	25.93	6.66	clear			
OFF	0950	~62	▽257.95		0	7.71	1896	26.01	4.42	clear	Total Cl₂ = 0.11		Free = 0.23
▽233.9	1402	@600'	→ Begin pumping	—	—	—	—	—	—				
	1410	~64	▽252.30		0	7.75	1508	24.86	26.6	0.09		2.22	
	1440	~64	▽255.62		0	7.88	1537	25.95	2.43				
	1508 - 1645	→ See Sampling Log											
	1725	64	▽256.53		0	8.03	1123	26.08	1.90				
	OFF 1725	→	▽240.30	—	—	—	—	—	—	SURGE			

Comments:
I-01 sampled collected 4/11/2018 @1623-

HALEY ALDRICH

DEVELOPMENT
FIELD DATA LOG

Project Name: FCI-PTP	Project No.: 129687-007
Well No.: I-01	Date: 4/11/2018
Location: Florence, AZ	Measuring Point:
Total Depth of Well (ft bls): 1200	Screen Interval (ft bls): 521-1201
Pump Type/Setting (ft bls): as noted below	Activity: pump
How Q Measured: totalizer + stopwatch	H&A Personnel: M. Cote

Totalizer (margin note)	Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ~~(µmhos/cm)~~ uS/cm	Temp. °C	Turbidity NTU	Comments
934638 ON	1745	~65	@600' ▽253.50		0	7.74	1541	25.96	2.21	
	1800	~65	▽253.20		0	7.78	1574	25.88	2.35	
936529 OFF	1815	~65	▽240.40		0	7.77	1530	25.64	2.71	SURGE #1 COMPLETE
936529 on	1920	~65	@600' ▽252.45		0	7.81	1493	24.49	2.60	Start Surge 2
	1935	~65	@600' ▽253.10		0	7.68	1521	25.35	1.63	
938 864 ~~936724~~ off 938204	1955	~65	▽253.70		0	7.88	1521	25.30	1.58	Surge #2 Complete
~~938204~~ on	2030	~65	@600' ▽251.90		0	7.73	1514	25.02	1.96	Start Surge #3
	2050	~65	▽253.50		0	7.74	1509	24.86	1.88	
941,404 off	2110	~65	▽254.30		0	7.85	1509	24.99	2.32	Surge #3 Complete
	0455	~14	@1165' ▽232.50		0	8.11	1411	21.71	25.6	Free Cl_2 = 0.22 Total Cl_2 = 0.31
	0530	~14	▽233.0		0	8.05	1468	23.21	6.78	↓ ↓
	0610	~14	▽232.90		0	8.01	1469	23.53	5.39	= 0.00 = 0.00
	0645	~14	233.0		0	8.0[illegible]	14[illegible]	2[illegible]	4.8[illegible]	
945000 off	0725	~14	~233.0		0	8.01	1514	25.19	7.54	
	0810		230.40 ~~230.4~~	STATIC					~~9.27~~ 10	
	0815	PUMP ON			<0.1	8.08	1517	24.48	9.27	Free Cl = 0.05 Tot = 0.04
	0815	13.7			~~<0.1~~	~~8.02~~	~~1508~~	~~25.09~~	~~7.27~~	
	0845	13.6	233	4	<0.1	8.02	1508	25.09	7.27	
	0930	14.6	233	6	<0.1	8.05	1524	25.25	3.06	SURGE #1
	0940	14.7	233	4	<0.1	8.	1576	25.24	2.56	
	1003	14.8	233	6	0	8.20	1522	25.57	5.02	
	1008									pump off

End Development

Comments:

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HALEY ALDRICH

APPENDIX I

Well Video Log and Gyroscopic Survey Reports

Southwest Exploration Services, LLC
borehole geophysics & video services

Southwest Exploration Services, LLC

25811 S. Arizona Avenue Chandler, AZ. 85248

Phone: (480) 926-4558 Fax: (480) 926-4579 Web: www.swexp.com

Client: Florence Copper | Survey Date: April 17, 2018

Address: 1575 West Hunt Hwy | Invoice: | Run: 1

City: Florence | State: AZ | Zip: 85132 | **Well Name:** I-01

Requested By: H&A | P.O.: | **Well Owner:** Florence Copper

Copy To: | Camera: CCV S.S. Color Camera - Ring of Lights

Purpose: General Inspection | Zero Datum: Top of Casing

Location: | Depth: 1200 ft. | Vehicle: 290

Field: Florence Copper Project | Type Perfs: Horizontal Slots

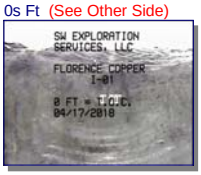
1st Csg.O.D. 5 In. | Csg Weight: | From: 0 ft. | To: 1195 ft. | 2nd Csg.O.D. | Csg Weight: | From: | To:

Standing Water Level: 239.06 ft. | Pumping Water Level: | Pump Depth: | O.D.Ref.: Measured | Casing Buildup: None

Operator: D. Beam | Lat.: | Long.: | Sec: | Twp: | Rge:

Other Information:

Wellbore Snapshots

0s Ft (See Other Side) 

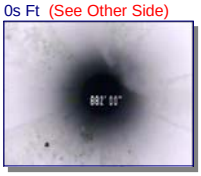
0s Ft (See Other Side) 

0s Ft (See Other Side) 

0s Ft (See Other Side) 

0s Ft (See Other Side) 

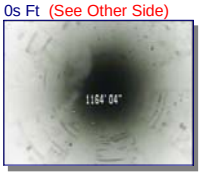
0s Ft (See Other Side) 

0s Ft (See Other Side) 

0s Ft (See Other Side) 

0s Ft (See Other Side) 

0s Ft (See Other Side) 

0s Ft (See Other Side) 

0s Ft (See Other Side) 

True Depths: (SideScan-Feet)	WELLBORE / CASING INFORMATION
0.	Survey started at the top of the case.
239.1	Static water level observed.
523.1	Transition piece observed.
523.1	First perforations observed.
645.1	Blank section.
723.1	Perforations observed.
882.	Perforations still appear clear.
980.	Perforations unchanged.
1,028.1	Perforations continue.
1,065.1	Perforations remain unchanged.
1,164.	Perforations near the bottom of the casing.
1,194.	Bottom of the well observed, survey ended.

Notes:

12 WELLBORE SHAPSHOTS

0s Ft (Enlargement)

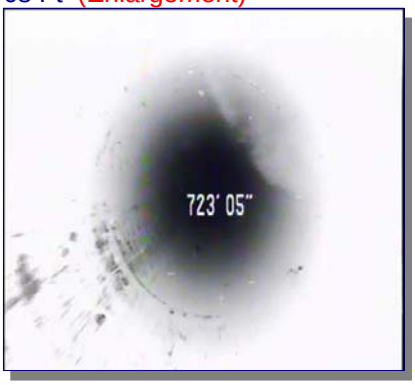
0s Ft (Enlargement)

0s Ft (Enlargement)

0s Ft (Enlargement)

0s Ft (Enlargement)

0s Ft (Enlargement)



0s Ft (Enlargement)

0s Ft (Enlargement)

0s Ft (Enlargement)

0s Ft (Enlargement)

0s Ft (Enlargement)

0s Ft (Enlargement)

Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR

Florence Copper and Florence Copper

I-01

Monday - May 7, 2018

Southwest Exploration Services, LLC
borehole geophysics & video services

Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

Company: Florence Copper **Well Owner:** Florence Copper

County: Pinal **State:** Arizona **Country:** United States

Well Number: I-01 **Survey Date:** Monday - May 7, 2018 **Magnetic Declination:** Declination Correction Not Used

Field: Florence Copper Project **Drift Calculation Methodology:** Balanced Tangential Method

Location:

Remarks:

Witness: H&A **Vehicle No.:** 310 **Invoice No.:** **Operator:** E. BEAM **Well Depth:** 1220 Feet **Casing size:** 5 Inches

Tool: Gyro - 1714 **Lat.:** **Long.:** **Sec.:** **Twp.:** **Rge.:**

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BGR., degrees
0	0.43	224.84	0.00						
20	0.28	218.94	19.99	-0.091	-0.084	1.00	0.41	0.12' (1.44")	222.50
40	0.20	218.17	39.98	-0.156	-0.136	0.41	0.05	0.21' (2.52")	221.10
60	0.20	221.41	59.97	-0.210	-0.181	0.96	0.22	0.28' (3.36")	220.80
80	0.14	241.88	79.96	-0.248	-0.226	0.84	1.41	0.34' (4.08")	222.30
100	0.07	240.69	99.96	-0.265	-0.258	0.42	0.08	0.37' (4.44")	224.20
120	0.14	319.27	119.95	-0.252	-0.285	0.13	5.03	0.38' (4.56")	228.40
140	0.12	343.40	139.94	-0.213	-0.307	0.43	1.66	0.37' (4.44")	235.20
160	0.13	017.81	159.93	-0.171	-0.306	0.83	2.35	0.35' (4.20")	240.80
180	0.16	012.81	179.92	-0.122	-0.293	0.95	0.35	0.32' (3.84")	247.40
200	0.18	035.68	199.91	-0.069	-0.268	0.37	1.58	0.28' (3.36")	255.50
220	0.16	039.34	219.90	-0.022	-0.232	1.00	0.25	0.23' (2.76")	264.60
240	0.20	109.15	239.89	-0.012	-0.181	1.00	4.55	0.18' (2.16")	266.30
260	0.19	083.35	259.88	-0.020	-0.115	0.34	1.77	0.12' (1.44")	260.30
280	0.16	116.99	279.87	-0.029	-0.057	0.93	2.30	0.06' (.72")	243.20
300	0.20	108.84	299.86	-0.053	0.001	0.78	0.56	0.05' (.60")	179.00
320	0.23	115.43	319.85	-0.082	0.070	0.53	0.46	0.11' (1.32")	139.20
340	0.24	112.33	339.84	-0.115	0.145	0.00	0.22	0.19' (2.28")	128.50

True Vertical Depth: 1187.17' **Final Drift Distance:** 14.47' (173.64") **Final Drift Bearing:** 93.50°

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

I-01

(480) 926-4558

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees
360	0.31°	111.40°	359.83	-0.151	0.234	0.56	0.06	0.28' (3.36")	122.80
380	0.40°	121.54°	379.82	-0.207	0.344	0.73	0.70	0.40' (4.80")	121.10
400	0.37°	107.82°	399.81	-0.263	0.465	0.88	0.95	0.53' (6.36")	119.50
420	0.47°	109.13°	419.80	-0.310	0.604	0.20	0.09	0.68' (8.16")	117.10
440	0.57°	104.10°	439.79	-0.361	0.778	0.97	0.35	0.86' (10.32")	114.90
460	0.73°	091.53°	459.78	-0.389	1.002	0.96	0.87	1.07' (12.84")	111.20
480	0.77°	096.70°	479.77	-0.408	1.263	0.12	0.36	1.33' (15.96")	107.90
500	1.11°	089.04°	499.76	-0.420	1.590	0.81	0.53	1.64' (19.68")	104.80
520	1.07°	091.48°	519.75	-0.422	1.970	0.59	0.17	2.01' (24.12")	102.10
540	0.92°	093.37°	539.74	-0.436	2.317	0.73	0.13	2.36' (28.32")	100.70
560	1.20°	090.06°	559.73	-0.446	2.687	0.28	0.23	2.72' (32.64")	099.40
580	0.87°	097.82°	579.72	-0.467	3.047	0.77	0.54	3.08' (36.96")	098.70
600	1.03°	100.36°	599.71	-0.520	3.374	0.49	0.18	3.41' (40.92")	098.80
620	1.12°	091.31°	619.70	-0.557	3.746	0.69	0.63	3.79' (45.48")	098.50
640	1.03°	093.57°	639.69	-0.573	4.121	0.13	0.16	4.16' (49.92")	097.90
660	1.32°	095.17°	659.68	-0.605	4.530	0.83	0.11	4.57' (54.84")	097.60
680	1.11°	094.60°	679.67	-0.641	4.953	0.80	0.04	4.99' (59.88")	097.40
700	1.12°	093.06°	699.66	-0.667	5.341	0.25	0.11	5.38' (64.56")	097.10
720	1.29°	095.44°	719.65	-0.699	5.760	0.54	0.17	5.80' (69.60")	096.90
740	1.21°	094.12°	739.64	-0.736	6.195	0.24	0.09	6.24' (74.88")	096.80
760	1.00°	091.76°	759.63	-0.757	6.580	0.94	0.16	6.62' (79.44")	096.60
780	1.14°	087.50°	779.62	-0.754	6.953	0.65	0.30	6.99' (83.88")	096.20
800	1.19°	088.21°	799.61	-0.739	7.359	0.97	0.05	7.40' (88.80")	095.70
820	1.19°	084.29°	819.60	-0.712	7.773	0.06	0.27	7.81' (93.72")	095.20
840	1.13°	082.93°	839.59	-0.667	8.175	0.29	0.09	8.20' (98.40")	094.70
860	1.02°	089.85°	859.58	-0.642	8.549	0.57	0.48	8.57' (102.84")	094.30
880	1.02°	100.28°	879.57	-0.673	8.902	0.47	0.72	8.93' (107.16")	094.30
900	1.68°	033.84°	899.56	-0.461	9.240	0.42	4.36	9.25' (111.00")	092.90
920	0.96°	095.60°	919.55	-0.234	9.570	0.69	4.08	9.57' (114.84")	091.40
940	1.02°	091.14°	939.54	-0.254	9.915	0.04	0.31	9.92' (119.04")	091.50
960	1.01°	090.34°	959.53	-0.259	10.269	0.30	0.06	10.27' (123.24")	091.40
980	1.04°	103.80°	979.52	-0.303	10.622	0.98	0.93	10.63' (127.56")	091.60
1,000	1.05°	093.76°	999.52	-0.358	10.981	0.95	0.70	10.99' (131.88")	091.90

True Vertical Depth: 1187.17' **Final Drift Distance: 14.47' (173.64")** **Final Drift Bearing: 93.50°**

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC
(480) 926-4558

I-01

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees
1,020	1.18°	092.26°	1,019.51	-0.378	11.370	0.96	0.10	11.38' (136.56")	091.90
1,040	1.42°	083.10°	1,039.50	-0.356	11.822	0.46	0.63	11.83' (141.96")	091.70
1,060	1.54°	097.78°	1,059.49	-0.363	12.334	0.25	1.02	12.34' (148.08")	091.70
1,080	0.94°	079.30°	1,079.48	-0.369	12.761	0.92	1.28	12.77' (153.24")	091.70
1,100	1.02°	099.14°	1,099.47	-0.367	13.098	0.09	1.37	13.10' (157.20")	091.60
1,120	1.09°	114.24°	1,119.46	-0.473	13.447	0.16	1.04	13.46' (161.52")	092.00
1,140	0.97°	125.60°	1,139.45	-0.650	13.758	0.98	0.79	13.77' (165.24")	092.70
1,160	1.04°	123.13°	1,159.44	-0.848	14.048	0.54	0.17	14.07' (168.84")	093.50
1,180	0.89°	085.74°	1,179.43	-0.936	14.355	0.80	2.55	14.39' (172.68")	093.70
1,188	0.71°	040.52°	1,187.17	-0.895	14.446	0.07	7.89	14.47' (173.64")	093.50

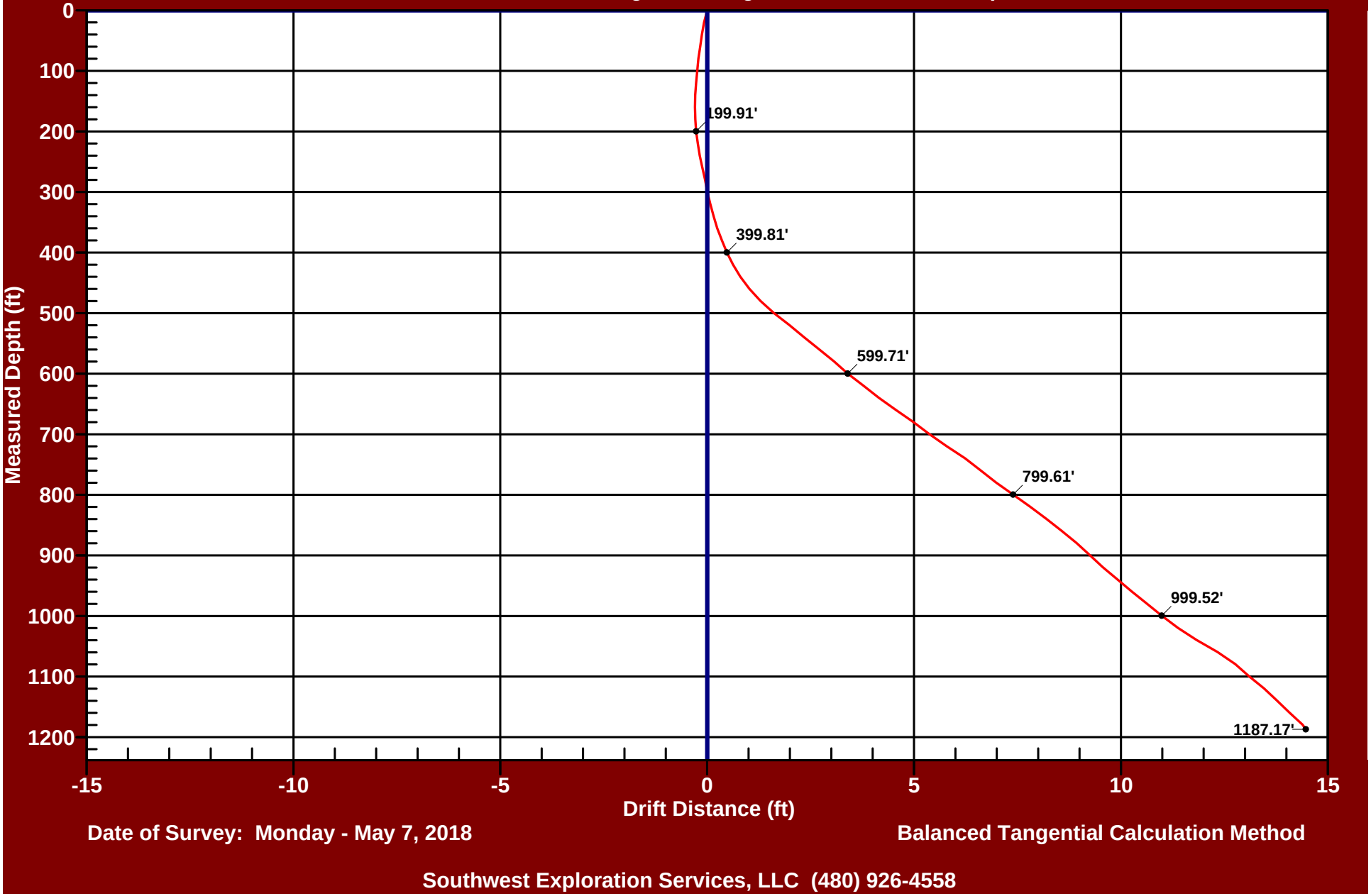
True Vertical Depth: 1187.17' **Final Drift Distance: 14.47' (173.64")** **Final Drift Bearing: 93.50°**

PLANE OF DRIFT VIEW - I-01

Florence Copper

Florence Copper

Drift Distance = 14.47 Feet Drift Bearing = 93.5 Degrees True Vertical Depth = 1187.17 Feet



Date of Survey: Monday - May 7, 2018

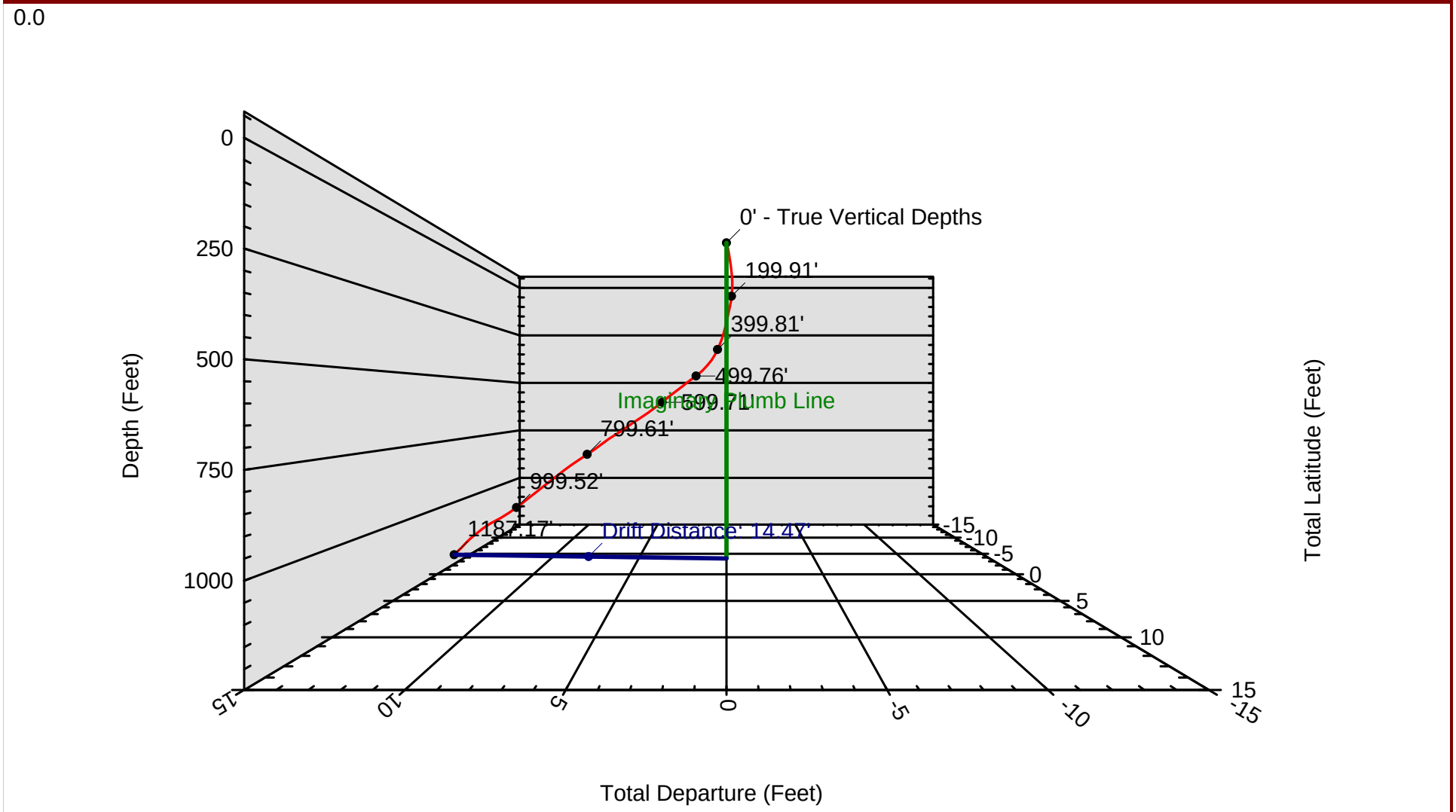
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

3D PROJECTION VIEW - I-01

Florence Copper
Florence Copper

Drift Distance = 14.47 Feet Drift Bearing = 93.5 Degrees True Vertical Depth = 1187.17 Feet



Date of Survey: Monday - May 7, 2018 **Balanced Tangential Calculation Method**

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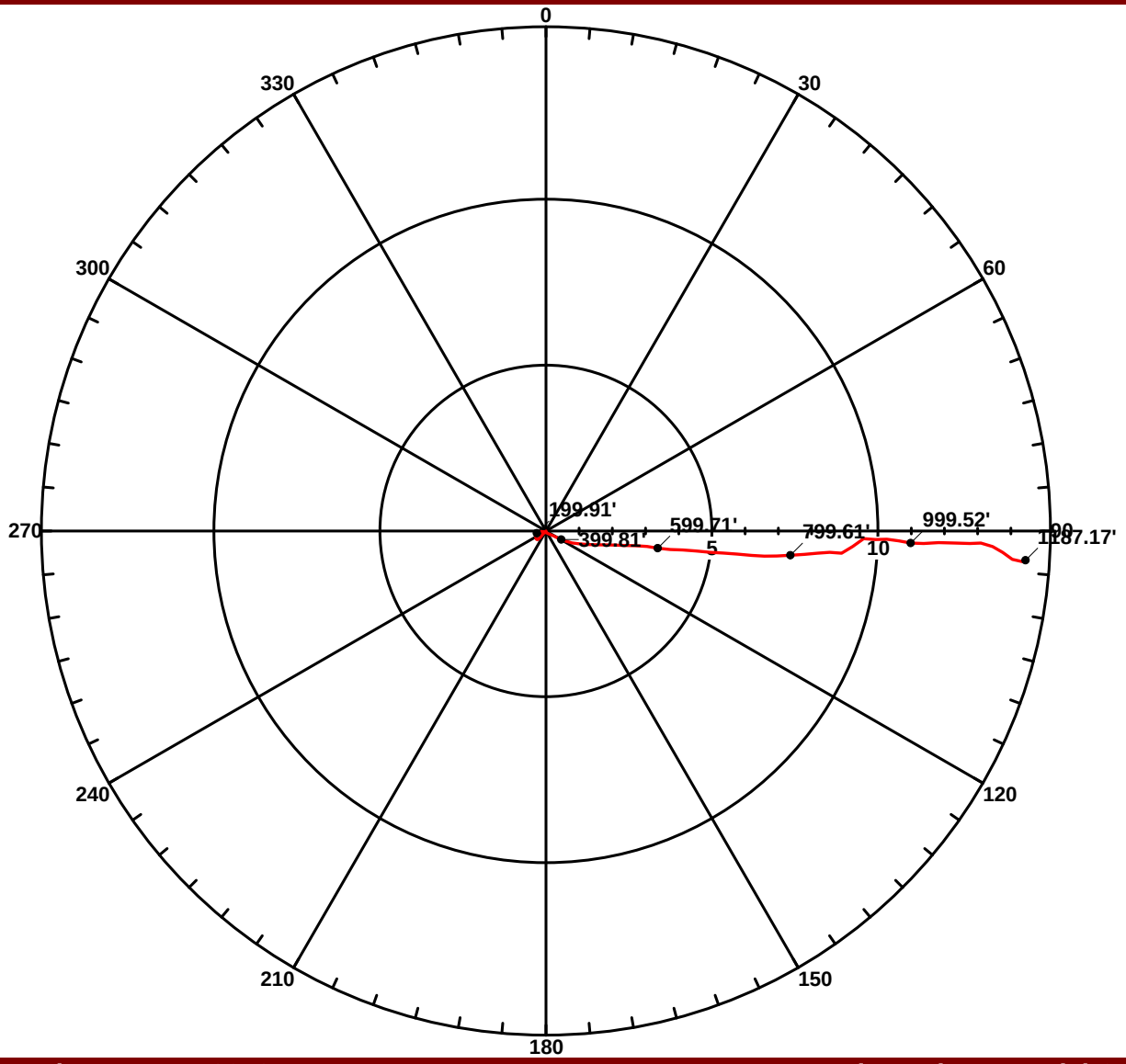
POLAR VIEW - I-01

Florence Copper
Florence Copper

Drift Distance = 14.47 Feet **Drift Bearing = 93.5 Degrees** **True Vertical Depth = 1187.17 Feet**



Date of Survey: Monday - May 7, 2018 **Balanced Tangential Calculation Method**

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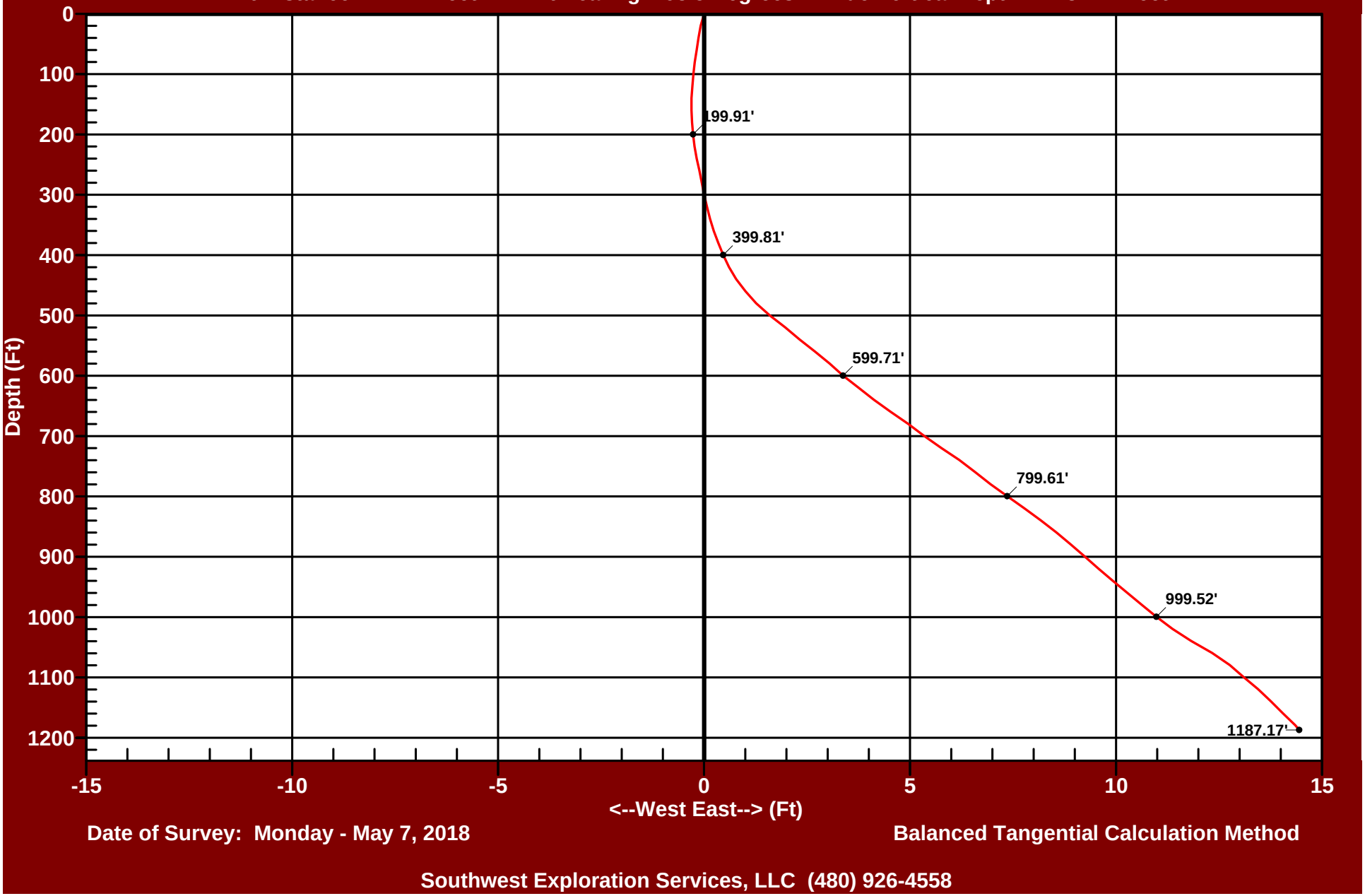
EASTING RECTANGULAR VIEW - I-01

Florence Copper

Florence Copper

Drift Distance = 14.47 Feet Drift Bearing = 93.5 Degrees True Vertical Depth = 1187.17 Feet



Date of Survey: Monday - May 7, 2018

Balanced Tangential Calculation Method

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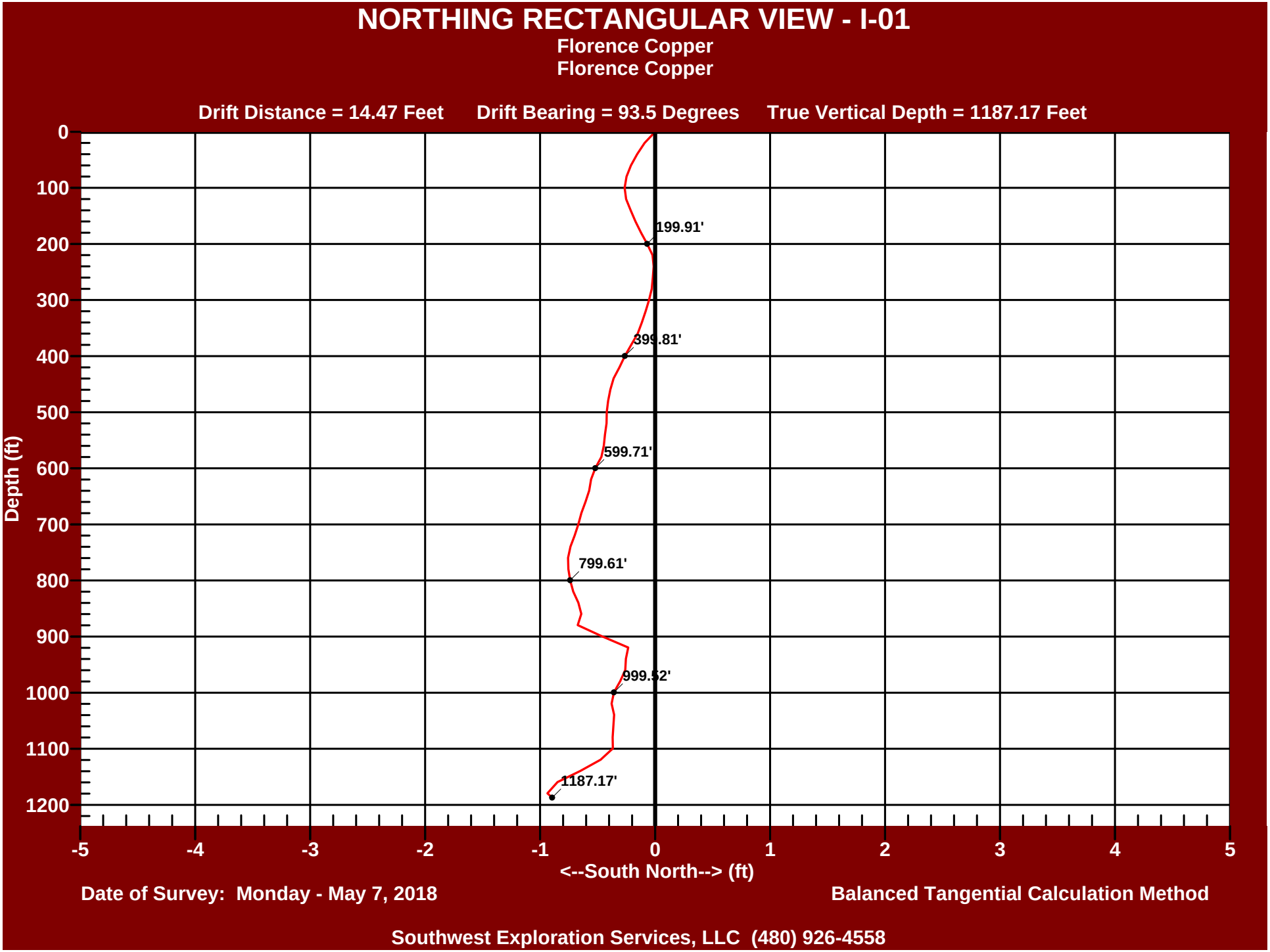
NORTHING RECTANGULAR VIEW - I-01
Florence Copper
Florence Copper
Drift Distance = 14.47 Feet
Drift Bearing = 93.5 Degrees
True Vertical Depth = 1187.17 Feet
Depth (ft)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
199.91'
399.81'
599.71'
799.61'
999.52'
1187.17'
-5
-4
-3
-2
-1
0
1
2
3
4
5
<--South North--> (ft)
Date of Survey: Monday - May 7, 2018
Balanced Tangential Calculation Method
Southwest Exploration Services, LLC (480) 926-4558